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DATAGRAM

Inflation and Medical School Faculty Salaries

Inflation has been a troubling phenomenon for the last several years for the medical schools and their faculties, as well as for other segments of the economy and other employed persons. This datagram compares a five-year span of faculty compensation data with the corresponding consumer price index in order to determine how medical school faculties have fared in keeping pace with inflation. (The data are based on the annual studies, *Report on Medical School Faculty Salaries*, of the Association of American Medical Colleges and on U.S. Bureau of Labor Statistics reports.)

Mean compensation data for basic and clinical science faculties are presented in Figure 1. During the period from September 1976 to September 1980, mean compensation for basic and clinical science faculties increased 32 and 36 percent respectively. After adjusting for inflation, however, mean compensation in constant dollars for basic science faculties declined by more than 9 percent. Clinical science faculties for the corresponding time span suffered a real loss in purchasing power of more than 6 percent. By way of comparison, the average weekly earnings, adjusted for inflation, of private nonagricultural workers declined by 7 percent over the same time period.

In 1976 the mean basic science compensation was equivalent to 65.4 percent of the average

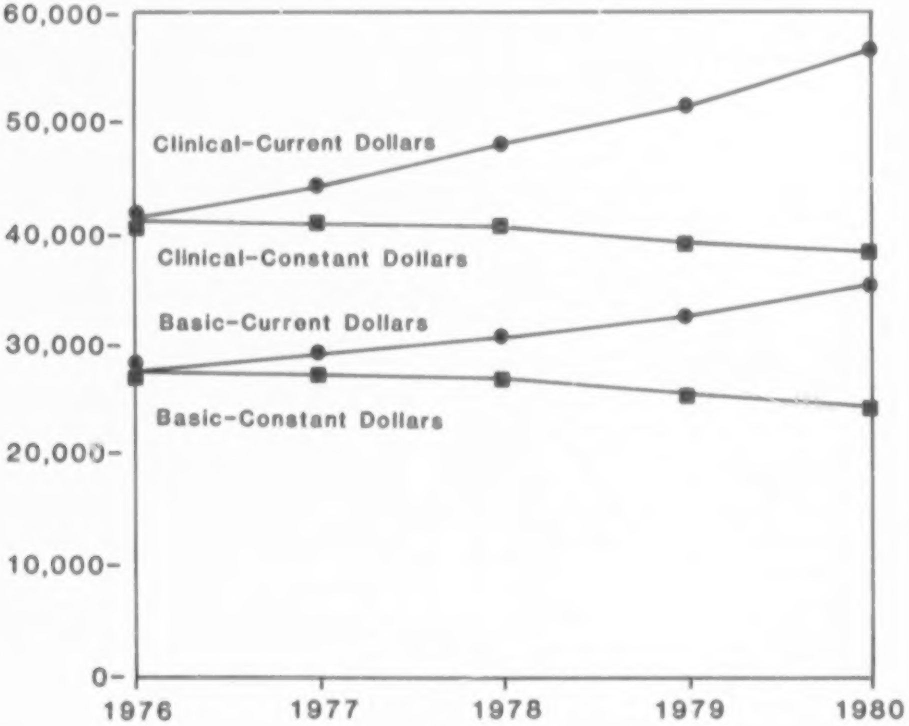

FIGURE 1
Mean salary for basic and clinical faculty in current and constant dollars.

TABLE 1
Comparison of Medical School Faculty Compensation, 1976-77—1980-81

	Basic Science Faculty			Clinical Science Faculty		
Year	Current Mean Salary	Equivalent Necessary To Maintain 1976 Purchasing Power	Cumulative Decrease in Real Purchasing Power	Current Mean Salary	Equivalent Necessary To Maintain 1976 Purchasing Power	Cumulative Decrease in Real Purchasing Power
September 1976	$27,300	$27,300	—	$41,700	$41,700	—
September 1977	28,900	29,200	1.0%	44,400	44,500	0.2%
September 1978	30,900	31,500	1.9	47,900	48,100	0.4
September 1979	33,100	35,300	6.2	51,600	54,000	4.4
September 1980	36,000	39,800	9.5	56,800	60,800	6.6

clinical science compensation; by 1980 this proportion had declined to 63.3 percent.

In order to purchase in 1980 goods and services identical to those purchased in 1976, basic science faculties would have had to earn a mean compensation of $39,800 in 1980 and the clinical faculty a mean compensation of $60,800 (Table 1). The actual mean compensations were $36,000 and $56,800, respectively.

These data reflect the relative worth of faculty positions over time and do not measure changes in income for the individual faculty member. A new assistant professor hired in 1980 had less purchasing power than an assistant professor hired in 1976. However, since individuals may have been promoted or received merit increases relative to the mean for their rank, these data do not show conclusively that individual faculty members lost purchasing power.

William C. Smith, Jr., *staff assistant, Division of Operational Studies, Association of American Medical Colleges, Washington, D.C.*

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A Study of Geriatric Training Programs In the United States

Alan S. Robbins, M.D., Susan Vivell, Ph.D., and John C. Beck, M.D.

Abstract—Training physicians in geriatrics is essential to improving health care for the elderly. The study reported here provides a detailed analysis of geriatric education at the undergraduate, graduate, and fellowship levels. The number of programs for medical students and residents has increased but is still relatively few; most are elective, and they are of variable quality. Both the number of fellowship programs (36) and positions (87) and the current number of yearly graduates (40) are quite small. Few of these programs have been thoroughly evaluated. Data are presented on the type of training sites, educational activities, and clinical interaction at different levels of training. Overall, the nursing home is most frequently used as a training site, and trainees have contact with many health care providers. Information of this kind may be of value to those planning or conducting geriatric programs. The results suggest that there is a persistent need for high quality geriatric programs at all levels of the educational continuum and that such efforts should be evaluated to ensure and improve quality.

In view of the health needs of the steadily increasing elderly population, geriatric training has recently received considerable attention. The American Geriatrics Society (1) and the Institute of Medicine (2) have strongly recommended geriatrics training for medical students and residents, especially those in primary care programs. While specialty recognition has not been endorsed, most groups have recommended training academic geriatricians to conduct research and educational programs in geriatrics (3).

Previous studies have focused on the growth of geriatric training in the United States (4–6). In 1976 very few medical schools required undergraduate courses in geriatrics and gerontology, and only 15 had separate educational programs of any kind (4). By 1979, however, 81 schools reported that they were sponsoring or developing such training activities (6). There is little evidence that the growth of geriatric medical education at the undergraduate and fellowship levels is being matched in primary care residency programs.

A detailed analysis of educational efforts can provide important information for policy-making decisions and aid those wishing to establish programs in geriatrics. The present study was undertaken to update information on the nature and extent of geriatric educational efforts in the United States.

The investigation on which this article is based was supported by contract V101(134)P-710, Office of Academic Affairs, Department of Medicine and Surgery, Veterans Administration.

Dr. Robbins is an assistant professor, Dr. Vivell is an administrative analyst, and Dr. Beck is a professor, Multicampus Division of Geriatric Medicine, Department of Medicine, UCLA School of Medicine, Los Angeles.

Methods

Beginning in November 1979, general requests for geriatric program information were circulated by the authors to all program directors and coordinators identified in the American Medical Student Association (March 1979) and Institute of Medicine (1979) directories. Solicitations were also directed to the academic deans of medical schools unreported in either directory. In this manner, all 126 accredited medical schools were contacted, and within each school multiple leads were followed in order to identify every possible effort in geriatrics. Further, solicitations were directed to specialty societies related to geriatrics and gerontology, to chiefs of staff at each Veterans Administration (VA) medical center, and to individuals known to have an interest in geriatric medical education.

By February 1980 some type of correspondence or other material had been received from 90 medical schools, 20 societies, and 10 VA medical centers. Responses fell into three categories: (*a*) descriptive program and course material; (*b*) statements of interest but no specific materials; and (*c*) statements to the effect that there was no specific course of instruction or developing effort in geriatrics.

While the general solicitations were being made, detailed reporting forms for geriatric programs at the undergraduate, graduate, and fellowship levels were developed by the project staff. The term "program" was defined as any substantive and discrete training activity (for example, lecture series, clerkship, rotation, fellowship) devoted solely or primarily to geriatrics. Major categories of information sought on each program included type of activity, program history, present and future enrollment, sponsorship and funding, faculty, curriculum (including research, administrative, teaching, and clinical activities), educational materials, and evaluation. Some items on the reporting form were prepared as forced-choice responses (for example, amount of time devoted to research, number of faculty members responsible for program), while other items allowed for multiple responses (for example, training sites used, funding sources). A parallel but more detailed form was developed to describe fellowship training.

The forms were pilot-tested by the project staff using actual program material and descriptions received from eight sites.

TABLE 1

Programs in Geriatric Medicine Training Identified and Surveyed, 1979–80

Program	No. of Medical Schools or Other Institutions with Programs*	No. of Programs Identified	No. of Program Surveys Completed	Percent of Identified Programs with Completed Surveys
Undergraduate medical education	76	133	108	81.2
Graduate medical education	35	44	37	84.1
Geriatric fellowship	34	42†	39	92.9
Total	92	219	184	84.0

* The number of accredited medical schools offering geriatrics instruction is 86; the number of nonaffiliated institutions is 6.

† On resurvey for 1981–82, 36 fellowship programs were identified.

They were also modified in response to feedback from 16 experts in the field of geriatrics and gerontology. All data collectors were trained to ensure acceptable levels of interrater reliability ($r \geq .75$).

In March 1980, information previously submitted by a person at each site was transposed onto the program description forms by the project staff. These initially coded forms were then sent to the original respondents for verification of accuracy and completion as needed. Although a few respondents completed the forms and returned them without further comment or contact, in most cases a telephone interview was conducted. The interview allowed for clarification and a more thorough verification of accuracy. Because no site visits were involved, requests for existing program descriptions and interviews to verify the accuracy of the forms were seen as a means of increasing the validity of the data. A second round of solicitations was made, and program description forms were sent to previously unresponsive schools; in cases where the requested information was not received, telephone contact was initiated until responses were received from all medical schools.

Because data collected refers to 1979–80 programs, fellowship positions and funding sources were made current through telephone interviews in May 1981.

Results

A total of 219 programs was identified in 86 medical schools and six institutions not affiliated with medical schools (Table 1). Of the 126 medical schools contacted, 35 reported no specific training in geriatrics, and eight reported that program development efforts in geriatrics were under way.

Of the 92 medical schools and other institutions reporting geriatric programs, 76 reported the presence of 133 programs at the undergraduate level, 35 reported 44 programs at the graduate medical education level, and 34 reported having 42 fellowship programs (Table 1). Only 12 sites, however, reported programs at each of the three levels, while 36 reported training at only one level. At two medical schools and three nonaffiliated sites, the training consisted of annual continuing medical education programs rather than instruction at one of the other three levels.

In collecting data, if only a negligible part of the program description form was completed (typically the program title, instructor, course number, and brief statement of objectives), the investigators tallied the program as having been identified but not surveyed. Of the 219 programs identified, surveys were completed on 184 or 84 percent of the total. Certain items in otherwise completed surveys were often omitted, notably number of trainees and type of program evaluation, and these items were, therefore, not included in the data analysis.

UNDERGRADUATE, GRADUATE PROGRAMS

As shown in Table 2, approximately half of all undergraduate and graduate medical education (GME) programs were instituted as recently as 1979. Relatively few were required activities (9.3 percent for undergraduate programs and 32.4 percent for GME). Within the GME programs, five of eight internal medicine rotations, five of 16 family practice rotations, and two of 10 psychiatry rotations were reported as required. At the undergraduate level, the mean duration of geriatric courses was 6.9 weeks; for graduate medical education the mean was 12.6 weeks. However, there was a large standard deviation, and many rotations were considerably shorter or longer in duration.

Approximately one-quarter of all programs (undergraduate and graduate) had graduated 10 or more trainees since the

TABLE 2

General Characteristics of Undergraduate and Graduate Geriatric Training Programs Surveyed

Characteristic	Undergraduate Medical Education	Graduate Medical Education
Beginning of program		
Prior to 1970	0	0
1970-1972	3	5
1973-1975	6	2
1976-1978	26	8
1979-1981	57	16
Unreported	16	6
Program status		
Required	10	12
Elective	89	25
Selective	9	0

inception of their courses. However, over half of the programs surveyed did not report the number of current or past trainees. In 50 of 108 undergraduate programs and 15 of 37 graduate programs, two or fewer faculty members had day-to-day program responsibilities.

Fifty-six of 63 programs surveyed for clinical medical students (medical students undertaking clinical rotations generally in the third and fourth year) and 34 of 37 graduate medical education rotations reported on the nature of clinical activities for trainees. At both levels, primary patient care and clinical conferences were reported as relatively frequent geriatric training activities (45 of 56 and 28 of 34 respectively). Team rounds and consultation and liaison activities were also found in over half of these programs.

From a list of 20 categories of medical and allied health personnel, medical students in their clinical years were reported to have some type of contact with an average of 10.2 categories of providers. For graduate medical education, the average contact with medical and allied health disciplines was 11.5. Social workers (45 of 55 programs) and registered nurses (44 programs) were the health providers with whom clinical medical students had the most contact, followed by internists (41 programs) and psychiatrists (41 programs). This pattern also held true for the graduate medical education level; contact with social workers (27 of 30 programs) and registered nurses (25 programs) was followed by contact with psychiatrists (24 programs) and internists (23 programs).

Clinical training sites for students, residents, and fellows are displayed in Table 3. For students and residents alike, the nursing home was the most frequently used site. Geriatric evaluation units, geriatric clinics, and home care programs were other sites often used for both clinical undergraduates and residents.

FELLOWSHIPS

As with geriatric training at the undergraduate and graduate medical education levels, the great majority of fellowship programs are of recent origin. Specifically, of 36 fellowship programs reporting their program histories, only two existed prior to 1970, and only one more had begun by 1975. Nine programs were initiated from 1976 through 1978, and 24 (two-thirds of the number of respondents) were begun in 1979 or later. The average duration of geriatric medicine fellowships was two years; for geropsychiatry programs, the average duration was one and one-half years.

The mean number of faculty members

TABLE 3

Geriatric Training Sites in Order of Decreasing Frequency for all Programs

Training Sites*	Percent Clinical Medical Students ($n = 59$)	Percent Graduate Medical Education ($n = 34$)	Percent Geriatric Medicine Fellowships ($n = 25$)	Percent Geropsychiatry Fellowships ($n = 13$)
Nursing home	76.3	52.9	72.0	46.2
Geriatric evaluation unit	40.7	35.3	68.0	
Geriatric clinic	35.6	35.3	80.0	
General medicine ward		47.1	60.0	
Senior citizen center	40.7			
Patient's home	32.2			
Home care program	32.2	26.5		
Rehabilitation ward			44.0	
Geropsychiatry ward		26.5		53.8
Psychiatry ward				46.2
Psychiatric clinic				69.2
Integrated health and social service center				30.8

* Other training sites included day care center, retirement home, family practice unit, general medical clinic, hospice, outpatient geriatric evaluation unit, surgical and other specialty wards, neighborhood health clinic, private practice, and public health clinic.

with daily fellowship program responsibility was 3.9, with 11 of 33 programs responding to the question reporting that day-to-day responsibility resides with one or two individuals. Of 22 geriatric medicine fellowships responding, 17 reported that faculty members with program responsibility had specialized in internal medicine, eight reported faculty members who specialized in psychiatry, and six reported faculty members who specialized in neurology. Family practitioners were identified in two programs, and in only four programs were responsible faculty members identified as "geriatricians." In all 13 geropsychiatry fellowships surveyed, psychiatry was the primary discipline of faculty members with major program responsibility.

As a prerequisite for prospective applicants, fellowships generally required training in internal medicine, psychiatry, and/or family practice. Ten of 11 geropsychiatry programs required an average of three years of training in psychiatry, while 23 of 24 geriatric medicine programs looked for three years in internal medicine and 20 of 24 considered candidates with three years of family practice.

When geriatric fellowships were surveyed as to various activities for fellows, all 39 programs reported some research activity on the part of trainees, 21 provided for up to 24 percent of the total time in research, 13 programs had their fellows spending 25 to 50 percent of their time in research, and one program reported fellows spending over half of their time in research. Of the fellowship programs reporting some type of research activity for trainees, basic biomedical and health services research received equally high attention (27 programs each) followed by psychosocial research (20 programs). Educational research was reported for the trainees of eight fellowships. All programs reported lectures, readings, and/or seminars for fellows, 32 of 39 programs reported teaching duties for fellows, and 30 of 39 reported some administrative responsibilities (defined as program administration, budget preparation, staff management, and or committee involvement).

Major clinical activities of fellows included participation in primary patient care (35 of 36 programs), consultation and liaison (32 of 36), clinical conferences and team rounds (30 of 36), and clinical teaching rounds (28 of 36). Out of 20 categories of medical and allied health professionals, fellows had contact with an average of 10.3 categories of providers in health care teams and 12.3 on an individual basis. Fellows had the most frequent contact with registered nurses, internists, and occupational therapists (36 of 38 programs), and psychiatrists and social workers (35 of 38).

Clinical training sites for fellows appear in Table 3. As would be expected, fellows were trained in more settings than undergraduates and residents. Aside from the use of nursing homes, the emphasis, however, is considerably different for geriatric medicine and geropsychiatry.

With regard to program evaluation, 17 of 25 fellowship programs (25 of 34 respondents) reported that they conducted evaluations, and the remaining eight reported that program evaluations were in the planning stage. Of the programs conducting evaluations, all reported faculty or supervisor review as an assessment technique. Other frequently used methods included review of fellows by medical students (11 programs), chart or other record review (10 programs), and peer review (8 programs).

Current fellowship programs resurveyed in May 1981 are displayed in Table 4. The total number of fellowship positions reported for the 1980–81 academic year was 87; for 1981–82, the number has increased to 94. Of the 87 positions available in 1980–81, 75 (86.2 percent) were reported filled. This number includes 48 first-year fellows, 26 second-year fellows, and one fellow in the third year. In July 1981, 40 fellows were expected to complete their programs. As of May 1981, 80 (85.1 percent) of the available positions for 1981–

TABLE 4

Geriatric Fellowship Positions and Funding Reported by 25 Programs in Geriatric Medicine and 11 Programs in Geropsychiatry, 1980–81

Fellowship/Funding	Geriatric Medicine	Geropsychiatry
Fellowships		
Positions available	67	20
Positions filled*	58	17
Fellows graduating July 1981	28	12
Funding Sources of Positions†		
Veterans Administration	32	2
Hospital supported	14	1.4
Medical school and department funds	5	2.8
National Institute of Mental Health		6.8
Administration on Aging	5.25	
Henry J. Kaiser Family Foundation	3.75	1.0
National Institutes of Health	3.00	
Other public	1.00	6.00
Other private	3.00	

* For the cycle beginning July 1981, 48 new fellows (39 in medicine and 9 in geropsychiatry) were reported to be enrolled.

† A position is defined as a full salaried fellowship as determined by the program and not the funding source.

82 had been filled. Funding for 1980–81 fellowship positions was supplied by both the public and private sectors. The Veterans Administration provided much of the funding for geriatric fellowships.

Discussion

The study reported here is a comprehensive attempt to characterize the current status of geriatric education in the United States. Although the data collected were not verified by on-site visits, they are likely to reflect in a relatively accurate way current educational programs in geriatrics. The survey instruments were extensive, and efforts were made to confirm information through telephone interviews. When data reported were grossly inadequate, as occurred in 35 (16 percent) of the 219 cases, the program was not included in the survey. Moreover, when specific pieces of information were incomplete on the forms, the items were omitted from that particular analysis.

Compared with the most recent estimates (4), the total number of programs available appeared to have increased substantially within the past two years, especially at the medical school level. However, the number of training efforts at all levels was still quite small. While 108 medical school programs were surveyed, most were elective (82.4 percent). At the GME level, very few programs (44 of them) existed in comparison with the number of residencies in internal medicine, family practice, and psychiatry (approximately 1062 residency programs in 1980) (7). Of those identified, only one-third were required rotations.

The many programs reporting neither the number of previous trainees nor the number of current trainees probably reflects not only the fact that many programs are only now seeing their first trainees but also the fact that most programs have had few trainees altogether.

Similarly, the number of faculty members with day-to-day responsibility in the programs was low; two or fewer faculty members were charged with responsibility for almost half the programs surveyed. Current efforts in geriatric undergraduate and graduate medical education can be characterized as recently emerging, largely elective, undersubscribed, and with relatively limited faculty involvement. Of 126 medical schools, fewer than half had discrete courses for medical students, and only 12 schools had geriatric training at all levels.

Analyses of the geriatric fellowships reveal some interesting characteristics. There seemed to be rather discrete training tracks for geriatric medicine and geropsychiatry. Many of the former were funded by the Veterans Administration and the latter by the National Institute of Mental Health. Only a small percentage of faculty members in these programs had specialty training in geriatrics, and the core specialties appeared to be internal medicine, psychiatry, and family practice in descending order of frequency. Clearly, geriatric medicine programs were staffed primarily by internists. A relatively small percentage of programs reported nonphysician faculty members, even though the practice of geriatrics is heavily interdisciplinary.

Most fellowship programs had been developed in the past several years. Prerequisite training for geriatric medicine fellowships was mainly in internal medicine, family practice, or, to a lesser extent, psychiatry and neurology; for geropsychiatry, the training track was usually psychiatry. As in many subspecialty fellowships, considerable training (an average of three years) and board certification were preferred in geriatrics.

Most fellowships provided broad training in clinical care, administration, and teaching and apparently were not highly research oriented. Indeed, very few allowed for 50 percent or more research time during the fellowship. If the primary purpose of these programs is to provide academic geriatricians, as is stated in the Institute of Medicine report, then more time should be allowed for research, or the fellowship should be expanded to a third year.

In most geriatric training programs for students, residents, and fellows, there was contact with many health providers and exposure to the health care team. Such exposure is essential for trainees and is central to providing high level care to the elderly. For students and residents, the nursing home was the usual training site, though a variety of different settings were utilized. A nursing home or home care setting for the aged is very appropriate for training but only if the training site functions optimally. It is unfortunate that students and residents have little opportunity for longitudinal patient care, which is necessary for them to appreciate fully the problems of chronic disease and interaction of psychological, social, and economic factors.

In approximately half of all programs surveyed there was some type of program or trainee evaluation. Most of the evaluations were quite rudimentary, and very few programs collected objective data on the effectiveness of their educational efforts or on the knowledge, skills, and attitudes of their trainees. In the new and rapidly expanding field of geriatrics, it is essential that training efforts be evaluated early so that programs can be modified to ensure a high level of trainee competence.

The results of the present study suggest that while there has been an overall increase in geriatric educational programs, the quantity and quality of training, especially at the undergraduate and graduate levels, are still considerably substandard. More required training with well conceived, high quality clinical work is needed. More geriatric faculty members are necessary to provide a meaningful experience. The number of graduates of geriatric fellowships is still substantially below projected manpower needs, even for those planning careers in research and teaching. Moreover, the competence of the graduates has usually not been assessed, especially in regard to academic careers in geriatrics. Recent reports of increasing attention directed at geriatric training should not lead anyone to believe that enough has been accomplished. The evidence indicates that there is still considerable need to improve educational efforts.

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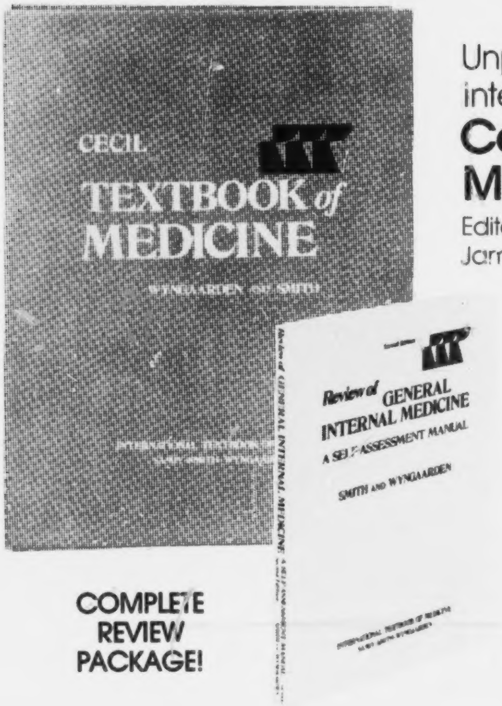

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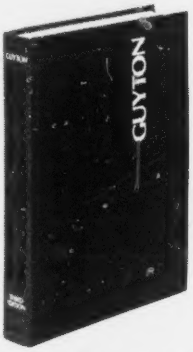

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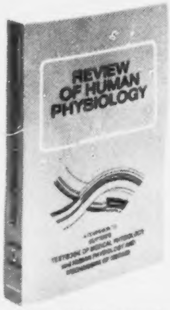

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Promotion Criteria: Perceptions Of Faculty Members and Departmental Chairmen

Craig L. Gjerde, Ph.D., and Sandra E. Colombo

Abstract—Medical school promotions committees tend to depend heavily on departmental evaluations of candidates for promotion. Unfortunately, departments often lack clear promotion guidelines; this results in confused perceptions of promotion criteria. Faculty members and department chairmen do not always see eye to eye. When asked to indicate which activities contributed the most toward achieving promotion to higher academic rank, faculty members in a large midwestern medical school perceived research to be the single most important activity. Departmental chairmen had a broader perception, however, and included research, teaching, patient care, and administration/service in their list of desirable and essential activities. Faculty members and chairmen differed significantly ($p < .01$) in their mean ratings on 12 of 69 activities. Such perceptual discrepancies can lead to conflict and disagreement that can be avoided by straightforward explanations of promotion criteria and more clearly defined job descriptions and time allocations.

Faculty members in medical schools are usually recruited and hired by departmental chairmen. Typically, new faculty members are advised that their success in academics will depend on their performance in four areas: teaching, service, research, and patient care. Faculty assignments in the areas of service, teaching, and patient care are usually made by the department chairman. On the other hand, research activities, while often an important factor in recruitment, are usually selected and conducted independently by faculty members. If a faculty member does well in these four designated areas of faculty responsibility, after a few years the chairman may choose to nominate him to the medical school promotions committee as a candidate for promotion to a higher academic rank.

While it is recognized that the decision to promote a faculty member to a tenured position may involve both the individual's merit and his value to the institution (1) (for example, the institution may value a competent female physician as a role model), traditional approaches to faculty evaluation have not always included this distinction. Faculty evaluation for promotion is typically conducted by a group of faculty members (the promotions committee) who too often consider only the merit, or "paper qualifications," of the

---

This study was supported by a grant from the National Fund for Medical Education.

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For related editorial, see page 200.

individual without taking into account the individual's value to his profession and/or department, which may be difficult to measure. The promotions committee necessarily depends heavily on the evaluations and recommendations of departmental chairmen. Unfortunately for both institutions and faculties, however, departments tend to lack clear and adequate guidelines for promotion (2).

The chairman-as-mentor system can work smoothly if the chairman and the faculty member share common perceptions about the activities that fulfill the medical school's criteria for promotion. When the chairman and the faculty member have different perceptions about what activities "count for promotion," conflict and disappointment can result. Vague guidelines tend to blur distinctions between ideals and reality. This study compares the perceptions of faculty members and departmental chairmen about what activities are in fact important as criteria for promotion.

Methods

Over 100 interviews were conducted with faculty members and department chairmen at a large midwestern medical school to identify perceptions about the faculty activities that contributed most toward promotion (3). From the criteria suggested by these interviews, a questionnaire listing 69 activities was constructed. Of these activities, 41 were subsumable under the four major areas of faculty responsibility; the other 28 activities (hereafter called other attributes) dealt with personal qualities and behaviors.

Faculty members and chairmen at the same school were mailed the survey questionnaire and asked, "How do the following activities apply as criteria for promotion in your department?" There were six potential responses: detrimental, undesirable, no effect, desirable, essential, and not sure. For analysis, the responses "detrimental" through "essential" were scaled as 1 through 5; "not sure" was combined with "no effect" to form a neutral midpoint category with a value of 3.

Results

The mean ratings given each activity by 393 faculty members (80 percent response rate) and by the 22 chairmen (100 percent response rate) are shown in Table 1. A multivariate comparison of the two sets of ratings indicated that there were some differences ($p < .05$) worthy of further investigation. Chairman and faculty means for each item were then compared using analysis of variance. If a mean rating of 4.0 is considered a cutting score for identifying the desirable or essential faculty activities, it can be seen that the faculty placed 11 activities in that category. Of these 11 highly rated activities, eight were related to research, one was related to service ("accept responsibilities delegated by your chairman"), none were related to either teaching or patient care, and two were related to other attributes ("be professionally respected by your chairman" and "be professionally respected by department members").

Chairmen, on the other hand, judged nearly twice as many activities—a total of 19—to be desirable or essential (Table 2). These 19 activities included eight related to research, four to teaching, one to patient care, two to service, and four to other attributes of person or situation ("be professionally respected by department members," "be professionally respected by your chairman," "have strong letters of reference from recognized experts in your field," and "maintain a professional image"). Of the 69 activities included in the survey, 46 showed no significant differences between the ratings of the faculty

TABLE 1

Rating of Activities as Criteria for Promotion by Faculty Members and Chairmen

Activity*	Mean†	
	Faculty Members (N=393)	Chairmen (N=22)
Be the primary author of journal articles	4.66	4.86
Publish articles in refereed journals	4.65	4.77
Publish articles that make a contribution to the field	4.47	4.55
Publish a certain number of articles each year	4.30‡	3.64
Present papers at professional meetings	4.24	4.43
Achieve national recognition for research	4.23	4.14
Be professionally respected by your chairman	4.22	4.32
Accept responsibilities delegated by your chairman	4.13	4.36
Be professionally respected by department members	4.12‡	4.64
Conduct lab-oriented research	4.07	3.91
Generate dollars to support research efforts	4.07	4.05
Conduct replicable research	3.94	4.36
Present papers by invitation at professional meetings	3.89	4.05
Have at least three years at the current academic rank	3.87	3.67
Maintain a professional image	3.82	4.18
Serve on departmental committees	3.78	4.00
Have high visibility within the academic community	3.75	3.82
Teach medical students	3.74	4.27
Have an influential chairman	3.74	3.48
Conduct clinically oriented research	3.72	3.64
Write textbooks	3.71	3.95
Teach graduate students or house officers	3.70§	4.18
Have strong letters of reference from recognized experts in your field	3.69‡	4.23
Be personally liked by your chairman	3.68	3.50
Be a member of a national review committee: for example, National Institutes of Health	3.68	3.91
Do an excellent job of teaching	3.68‡	4.23
Conduct research which is supportive of the department's direction	3.68	3.67
Be a member of an editorial board	3.66	3.77
Have high visibility within your department	3.65	3.62
Be personally liked by department members	3.65	3.82
Have a pleasing personality	3.61	3.59
Get outside employment offers from institutions of similar prestige	3.60	3.50
Profess congruence with departmental goals and norms	3.60	3.73
Receive teaching award(s)	3.60	3.82
Serve on medical school committees	3.60	3.77
Be an innovative teacher	3.58‡	4.05
Get favorable student evaluations for teaching	3.58	3.91
Achieve national recognition for teaching	3.56	3.86
Participate on university committees	3.55	3.77
Provide competent patient care	3.54§	4.05
Be a good administrator	3.53	3.62
Teach formal courses	3.52	3.82
Have high visibility within the medical school	3.52	3.59
Follow regular channels to solve problems in your department	3.50	3.82
Participate in grand rounds	3.43	3.68
Participate in interdisciplinary projects or programs	3.43	3.68
Be a course director	3.42	3.52

(*Continued on next page*)

TABLE 1—continued

Activity*	Mean†	
	Faculty Members (N=393)	Chairmen (N=22)
Achieve national recognition for patient care	3.42	3.71
Conduct ward rounds	3.41	3.64
Don't challenge what the department chairman tells you to do	3.39§	2.90
Conform to the social norms of the department	3.39	3.29
Teach practicing physicians	3.37	3.62
Be a section chief	3.36	3.18
Be aggressive	3.35	3.14
Socialize with others in the department	3.33	3.29
Be advised by a senior faculty member on getting through the system	3.29	3.90
Be a member of an inner group within your department	3.27§	2.86
Participate in committees outside the university	3.26§	3.68
Have both M.D. and Ph.D. degrees	3.25	3.14
Have high visibility outside the academic community	3.25	3.41
Counsel students	3.23‡	3.91
Teach six-year B.S./M.D. students	3.21	3.32
Negotiate promotion when hired	3.21§	2.71
Teach students in other health professions; for example, nursing, dentistry, allied health	3.15	3.36
Teach undergraduate students in liberal arts	2.97	3.05
Hold a joint appointment	2.91	2.95
Have a heavy formal teaching load	2.76	2.86
Pursue research interests which differ from departmental interests	2.75	2.81
Get unfavorable student evaluations for teaching	2.24	1.86

* Activities are ranked by faculty mean ratings.

† 5=essential, 4=desirable, 3=no effect or not sure, 2=undesirable, and 1=detrimental.

‡ $p < .001$ (one-way analysis of variance between chairmen and faculty members).

§ $p < .01$ (one-way analysis of variance between chairmen and faculty members).

members and those of the departmental chairmen ($p > .05$), 11 differed moderately ($p < .05$), and 12 differed significantly ($p < .01$). Since out of these 69 comparisons three or four could appear significant by chance variation alone (using alpha equal to .05), only the 12 differences whose chance likelihood was less than 0.01 will be discussed further.

In their perception of the promotion system, faculty members placed much greater emphasis than chairmen on publishing a certain number of articles each year ($p < .001$). They also placed significantly more emphasis ($p < .01$) on three other attributes relating to manipulative behaviors—negotiating promotions when hired, being a member of an inner group in the department, and not challenging what the department chairman asks them to do. (Chairmen assigned these last three activities ratings just lower than 3.0, denying in effect that such behaviors make much difference either way.)

Departmental chairmen rated eight activities significantly higher ($p < .01$) than the faculty. Counseling students and participating on committees outside the university were considered moderately important by the chairmen but of relatively low importance by faculty members. The other six activities rated significantly higher by chairmen were activities which they perceived to be desirable or essential for pro-

TABLE 2

Essential and Desirable Activities for Promotion as Ranked by Departmental Chairmen

Rank	Activity
1	Be the primary author of journal articles
2	Publish articles in refereed journals
3	Be professionally respected by department members
4	Publish articles that make a contribution to the field
5	Present papers at professional meetings
6	Accept responsibilities delegated by your chairman
7	Conduct replicable research
8	Be professionally respected by your chairman
9	Teach medical students
10	Have strong letters of reference from recognized experts in your field
11	Do an excellent job of teaching
12	Maintain a professional image
13	Teach graduate students or house officers
14	Achieve national recognition for research
15	Generate dollars to support research efforts
16	Present papers by invitation at professional meetings
17	Be an innovative teacher
18	Provide competent patient care
19	Serve on departmental committees

motion: "be professionally respected by departmental members," "teach graduate students or house officers," "have strong letters of reference from recognized experts in your field," "do an excellent job of teaching," "be an innovative teacher," and "provide competent patient care."

Discussion

In this study departmental chairmen and faculty members both recognized the importance of research, publication, and professional respect for faculty members who aspired to promotion to a higher academic rank. Chairmen, however, had a much broader view of what activities were important; they identified as desirable or essential activities from all four areas of faculty responsibility. However, the question is whether a faculty member would be willing to devote adequate time to those activities, such as serving on departmental committees or teaching medical students, that he perceived as contributing little toward his promotion. At the same time, if a departmental chairman believed that those activities were desirable or essential experiences for a faculty member to have, he would surely want to give each faculty member ample opportunity to achieve them. Differences of opinion about what activities are important can lead to confusion, misplaced emphases, and, eventually, terminal appointment for the faculty member who fails to perform to the institution's expectations.

One explanation for these discrepant opinions about what counts for promotion is that faculty members too often see only the institutional-level review conducted by the medical school promotions committee. At many large universities this institutional-level review appears to be based mainly on "scholarly activities" (that is, research and its publication). The institutional promotion committee may assume that the faculty member's teaching, patient care, and service (which are administered and conducted through the department) have been thoroughly assessed during an earlier departmental-level review. Responses to another component in this study indicate that many faculty members were also confused about procedures in the promotion process and were sometimes totally unaware that their departmental promotions committee was reviewing their credentials. This unawareness, while it may be somewhat surprising, does help to explain the heightened visibility of the promotion deliberations conducted at the institutional level.

Such confused perceptions of promotion criteria have some unfortunate, if not disastrous, implications for faculty performance in certain areas. At the very least, they are indicative of a considerable communications gap between faculty members and departmental chairmen that can be as detrimental to departmental function and to medical education as to faculty success. Three administrative steps may lessen these confusions. First, the chairman should explain to each new faculty member the criteria for promotion at both the departmental and institutional levels; this is the faculty member's equivalent to informed consent. Second, the chairman should annually negotiate a job description and time allocation with each faculty member; this job description should allow the faculty member to participate in all desirable and essential activities and should be the basis for the faculty member's evaluation for promotion. Third, the institutional promotions committee should insist on reviewing these annual job descriptions and evaluations as a part of its deliberation about the qualifications of the person being considered for promotion.

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The Predictive Value
Of the Premedical Grade-Point Average

Randolph E. Sarnacki, Ph.D.

Abstract—The study reported here assessed the relative utility of premedical grade-point average (GPA) in distinguishing among prospective medical students and in predicting the medical school performance of accepted applicants. Students from each of two medical classes were grouped into one of four categories depending on the "selectivity" rating of their premedical, undergraduate institution. Group differences were assessed according to premedical GPAs, Science subtest scores of the Medical College Admission Test, medical school course work, and scores on the Part I and Part II examinations of the National Board of Medical Examiners. Results indicated that although the groups differed significantly on premedical GPA (with mean scores from the less competitive undergraduate colleges exceeding those of the most selective schools), on all other dependent measures no significant differences resulted. It was concluded that "raw" premedical GPA is susceptible to a number of extraneous sources of variance that, unless identified and eliminated, negate its effectiveness in assessing individual differences in past academic achievement and in predicting future medical school performance.

Although the undergraduate medical college is beginning to experience a decrease in the number of applicants for the first-year student positions, it nonetheless is still experiencing a relatively large absolute number of applicants. Faced with the situation of having many qualified applicants but a limited number of positions, admissions committees must identify relevant variables that allow accurate prediction of successful futures in medical school. Fortunately, a wealth of practical experience combined with numerous empirical studies have consistently identified several predictor variables that demonstrate a positive relationship with performance measures in medical school (1–5).

Repeated experiences with these variables have demonstrated such consistent predictability (or lack of it) of medical school performance that individual admissions committees have been able to create a hierarchy of predictors, weighting and placing them into regression equations in order of their relative utility in predicting desired academic outcomes (6).

Since previous research has adequately demonstrated differences in predictive utility among predictor variables, it is unnecessary to reiterate their predictive order here. However, it is important for admissions officers to be aware that individual differences within a specific predictive

---

Dr. Sarnacki is the assistant director of educational research and evaluation and an assistant professor of social and preventive medicine at the State University of New York at Buffalo School of Medicine.

measure may be inappropriately exaggerated by extraneous sources of variation that serve to reduce the variable's predictive accurateness.

A predictor that may demonstrate large individual variation is undergraduate (premedical) grade-point average (GPA). A strong possibility exists that the observed variation is not a result of actual individual differences in academic abilities, but may be due to some extent to such extraneous factors as educational discrepancies in the undergraduate institutions and the differing grading philosophies. Consequently, since the variable which admissions officers are primarily interested in is academic ability and not nuances of the undergraduate institution, it is imperative that each medical school arrive at some solution to this problem so that accurate and fair consideration is given to all applicants.

A number of possible solutions already exist and have been suggested in part elsewhere (7). First, it is possible to consider a student's "raw" GPA as it stands without making any modifications based on his undergraduate institution. However, such an approach ignores the fact that disparate grading practices across institutions in essence indicate that different measuring instruments are being used or even that different variables are being measured. A second possible solution suggests a molar qualitative decision based on the quality of the undergraduate institution itself. For example, at relatively equal levels of undergraduate GPAs, those that were earned at a large private institution may be better indicators of medical school success than those obtained at a small liberal arts college. GPAs at a small liberal arts college, in turn, may be better predictors than those obtained at a state university. However, such an approach is erroneous in that it measures the quality of the institution instead of the quality of the applicant. Although "undergraduate college attended" may in itself be a viable predictor of performance in medical school and should certainly be considered in the admissions context, it is not the major component of an individual's academic course performance. Finally, it is possible to utilize information concerning qualitative differences among undergraduate institutions in suggesting logical and statistical modifications of GPA data for purposes of predicting medical school performance. Such techniques may include the assignment of beta weights, derived from regression analyses on previous medical classes, to new predictive equations with applicant GPA data. Or, a numerical constant could be added to those GPAs which appear "deflated" in comparison with others but which were earned at a prestigious institution.

It is the contention of the author that before any strategy is employed in reinterpreting the GPA variable a number of concerns must be initially addressed. First, it is necessary to demonstrate whether significant differences in GPA do, in fact, exist among medical students from different "types" of undergraduate colleges. Second, it must be determined whether any existing premedical GPA discrepancies provide the basis for accurate prediction of future similar discrepancies on medical school performance measures. Finally, the information concerning the nature of any academic discrepancies at entrance and during medical school must be weighted individually by each individual medical school to determine the premedical GPA interpretation most appropriate for its admissions procedures.

The purpose of the study reported here, then, was (*a*) to examine whether entering medical students in one medical school differed in premedical GPA based on their undergraduate schools (and, if so, to what extent); (*b*) to examine the extent to which observed differences in undergraduate GPA were replicated in medical school performance and performance on the Part I and Part II examinations of the National Board of Medical Examiners (NBME); and (*c*) to suggest specific means by which any GPA variation caused by the undergraduate college can be accurately evaluated in the admissions process.

Methods

Subjects in the study included 103 students from the graduating class of 1979 and 91 students from the graduating class of 1980 of the State University of New York at Buffalo (SUNYAB) School of Medicine. For each entering year of a class of 135 persons, all subjects on whom complete data were available were included in the study. Subjects within each class year were considered as separate replications of the same study, with subsequent comparisons and analyses performed separately within each of the two classes. Since it was thought that the two classes represented two distinct experimental populations encountering slightly different course material and dependent measures, it was decided to study samples from each population separately in the hope that this would provide a degree of generalizability not available without such replication.

The students were measured on three general sets of dependent measures. The first set consisted of premedical school data: their score on the Medical College Admission Test (MCAT) Science subtest and both their undergraduate science GPA and undergraduate total GPA (both GPAs measured on a 4.0 scale with A = 4.0). The second measure was their performance in the basic science course work of the first two years of the undergraduate medical curriculum. The subjects' final grades in 15 courses were recorded as three-digit standard scores (mean = 500, S.D. = 100), which represented mean scores of all examinations within each course. The third set of dependent measures consisted of performance on Part I and Part II of the NBME examinations. The subjects' standard scores were recorded for the seven basic science subscales and total score of the Part I exam. Similarly, on Part II, the subjects' standard scores were recorded for the six clinical science subscales and for the total score.

To determine whether students from various types of undergraduate institutions perform significantly differently on the dependent measures, subjects were classified according to the "selectivity" of the college they attended. The classification system employed was Barron's College Admissions Selector (8). This classification index groups undergraduate colleges and universities according to the degree of competition for admission. The Barron index uses these criteria: "median entrance examination scores for the most recent freshman class (Scholastic Aptitude Test [SAT] scores are averages of verbal and mathematical; American College Testing [ACT] scores are composite); percentage of students scoring above 500, above 600, and above 700 on both the mathematical and verbal sections of the SAT; grade average or class rank required for admission; and the proportion of applicants that the college offered acceptance to, especially when there were many more applicants than could be accepted." It carries this disclaimer: "The Selector is not a rating of colleges by academic standards or quality of education; it is rather an attempt to describe, in general terms, the situation a prospective student will meet when he applies for admission." However, in reality, the level of selectivity of an applicant's undergraduate college in the Barron's Selector is often used as a factor in the medical school admissions decision. Consequently, in the study reported here subjects were classified as members of one of four groups, based on their college's categorization in the Barron's system. The colleges attended by the subjects encompassed the top four categories of the Barron's Selector. The specific descriptive criteria for each of these categories are summarized elsewhere (8).

In descending order, from the most selective to the lesser selective categories, in the 1979 data this classification resulted in 31 students in the "most competitive" category; 15 students in the "highly competitive" category; 31 in the "very competitive" category; and 26 in the "competitive" category. The numbers for the class of 1980 were: most competitive, 22; highly competitive, 19; very competitive, 27; and competitive, 23.

To determine whether significant differences in premedical GPA exist between the four categories of undergraduate colleges represented in each of the SUNYAB medical classes of 1979 and 1980, univariate analyses of variance were performed among the four groups on both undergraduate science GPA and on undergraduate total GPA. In addition, univariate analyses of variance were performed between the four groups on MCAT Science subtest scores.

To determine whether differences exist between the four college categories in academic performance in medical school course work, multivariate analyses of variance were performed among the groups on both the set of eight first-year courses from the student's medical curriculum at SUNYAB and the set of seven second-year SUNYAB courses. Univariate analyses of variance were also performed among the groups on all 15 courses in order to determine whether there were any specific substantive trends of statistical significance. Similarly, in order to determine whether differences exist among the groups in performance on standardized tests of the same academic material, multivariate analyses of variance were performed on both the seven subscales of the NBME Part I examination and on the six subscales of the NBME Part II exam. In addition, separate univariate tests of significance were performed on each subtest and on total score for both Parts I and II.

Results

Means and standard deviations for the four group's undergraduate science GPAs and undergraduate total GPAs for both the class of 1979 and the class of 1980 are presented in Table 1. Examination of the

TABLE 1

Means and Standard Deviations of Premedical Science GPA, Premedical Total GPA, and MCAT Science Scores of Classes of 1979 and 1980, State University of New York at Buffalo School of Medicine

Selectivity Rating of Undergraduate College	Science GPA		Total GPA		MCAT Science	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Medical Class of 1979						
Most competitive	3.17	0.54	3.26	0.44	601.5	75.4
Highly competitive	3.24	0.42	3.37	0.27	618.3	67.8
Very competitive	3.46	0.20	3.49	0.17	653.1	58.7
Competitive	3.62	0.28	3.64	0.24	608.5	83.8
Medical Class of 1980						
Most competitive	3.41	0.41	3.40	0.29	634.6	74.5
Highly competitive	3.51	0.40	3.52	0.36	613.0	74.9
Very competitive	3.61	0.20	3.64	0.15	634.1	53.5
Competitive	3.75	0.27	3.75	0.23	609.1	64.6

mean scores reveals that in both classes, on both measures of GPA, the mean order by magnitude runs in reverse order of categorical college ranking, with the competive group having the highest mean scores and the most competitive group the lowest mean scores. In the 1979 data the omnibus test of significance between these mean values resulted in a statistically significant F value of 7.740 ($df = 3, 99$; $p < .01$) for the science GPA variable and a statistically significant F value of 8.019 ($df = 3, 99$; $p < .01$) for the total GPA variable. Similarly, in the 1980 data statistical significance was found on both dependent variables with a resulting F value of 4.632 ($df = 3, 87$; $p < .01$) on science GPA and an F of 7.212 ($df = 3, 87$; $p < .01$) on total GPA.

To further address the issue of whether higher premedical GPAs indicate better past achievers and better prospective medical students, the mean MCAT Science subtest scores of the four college categories were compared. In the 1979 MCAT Science data, significant differences did occur ($F = 3.076$; $df = 3, 99$; $p < .05$). However, the MCAT mean ordering by magnitude differed from that in the GPA data. Instead of following the reverse order of college categorical ranking as before, the mean order from highest to lowest was very competitive, highly competitive, competitive, and most competitive (Table 1). In the 1980 MCAT data no statistical significance was obtained ($F = 1.101$; $df = 3, 102$; $p = .35$), and the mean orderings are also presented in Table 1. (In the 1980 MCAT Science data, 106 subjects were available for analysis. Their categories were: most competitive, 26; highly competitive, 20; very competitive, 33; and competitive, 27.) This absence of consistent and significant trends in the MCAT data may cast doubts as to the accuracy of the premedical GPA as a uniform measure of academic ability. Since all of the subjects in these analyses were students in medical school and not rejected applicants, it is reasonable not to find significant differences between groups on various predictor measures. Therefore, the fact that the GPA analyses did find significance but did not resemble the results of the analyses on the more reliable MCAT arouses some doubt as to the predictive utility of premedical GPA.

The issue of predictive utility was further addressed in the analyses of academic performance in medical school. The multivariate analyses of variance between the four college categories on the set of eight first-year medical courses yielded no statistical significance in both the 1979 data ($F_{\text{mult}} = 1.219$; $p = .22$) and in the 1980 data ($F_{\text{mult}} = 0.907$; $p = .59$). In addition, the eight univariate analyses in the 1980 data were all nonsignificant, and only one of the eight (histology) in the 1979 data resulted in significance ($F = 2.988$; $df = 3, 99$; $p < .05$). However, in the mean ordering in the histology analysis, the competitive group dropped to the third highest among the four college categories, from its position of the highest group mean in the premedical GPA analyses. The multivariate analyses of variance among the four groups on the set of seven second-year courses were also nonsignificant for both the 1979 ($F_{\text{mult}} = 0.742$; $p = .79$) and 1980 data ($F_{\text{mult}} = 1.040$; $p = .42$). As expected, all seven univariate analyses in both years were also nonsignificant. In both years in all of the analyses on students' performance in medical school, the mean orderings for the four college groups followed no consistent pattern or a pattern predictable from the previous significant premedical GPA analyses. That is, the competitive group which demonstrated a higher premedical GPA did not continue to demonstrate higher achievement in medical school be it statistically significant or not.

Multivariate analyses of variance on the seven subscales of the NBME Part I exam showed no significant differences in either the 1979 ($F_{mult} = 0.578$; $p = .93$) or 1980 data ($F_{mult} = 0.713$; $p = .71$). Similarly, the multivariate analyses of variance on the six subscales of the NBME Part II exam resulted in no significance. In the 1979 data, $F_{mult} = 0.742$ ($p = .77$), and in the 1980 results, $F_{mult} = 1.106$ ($p = .44$). As expected from these results, in both years the univariate analyses on each subtest and total score considered separately were nonsignificant. Again, the mean orderings followed no consistent or predictable pattern.

In summary, across two class years, of 60 univariate tests of significance assessing mean differences among four undergraduate college categories on a variety of medical school academic measures, only one test resulted in statistical significance. Furthermore, the direction of the observed mean orderings in the one significant result was different than expected from the previous statistically significant findings between the college groups on undergraduate GPA.

Conclusions

The results of this study indicated that within the SUNYAB data significant differences in undergraduate GPA did exist among the categories of undergraduate institutions suggested by Barron's Selector. However, these group differences were not observed in the Science subtest of the MCAT, nor did they continue to manifest themselves in course work in medical school or in the NBME examinations. The immediate implications of these results are an affirmation of earlier findings that "raw" premedical GPA is not a particularly successful predictor of academic success in distinguishing among students accepted to medical school (9). If premedical GPA were a reliable predictor, similar significant results (or at least similar mean orderings) should have occurred in both the GPA and medical school performance analyses. The fact that the significant mean GPA orderings favored the "less selective" undergraduate institutions but failed to recur in medical school performance suggests that some sort of adjustment to raw GPA should be made on the basis of institutional selectivity before premedical GPA is used as a predictor of future academic performance.

Although the study did not undertake to assess the efficacy of a specific method of adjusting GPAs, the following suggestion is offered. It may be possible for medical schools to group applicants by the selectivity of the undergraduate institution they attended and then to calculate the magnitude of the observed premedical GPA mean difference among college groups. If this procedure is repeated for a number of entering classes and if relatively stable results occur, it would then be possible to adjust the GPA toward a common "mean" based on group membership. For example, an admissions committee could add points to a GPA that is "deflated" but earned at a school in the most competitive category or subtract points from an "inflated" GPA earned at a competitive school. Or more simply, it may be reasonable to add or multiply the GPA by some constant based on group (college category) membership. However, in this instance, it is extremely important that the differences in premedical GPA be accurately assessed in each school's applicant pool so that the benefit of the derived constant is neither too large nor too small and is relative to the GPA differences observed between the groups (especially when there are more than two groups involved).

This study also demonstrated that knowledge of the selectivity of an undergraduate institution does not yield consistent results in distinguishing among accepted students on various predictor variables. Although the contribution of possible specific factors was not addressed in this study, the disparate results of the MCAT (no significant differences) and GPA (significant differences) analyses appear to indicate that premedical GPA may, in fact, be susceptible to extraneous factors that erroneously point to differences in academic abilities of accepted students. As stated earlier, various hypothesized influences may include grade inflation, disparate grading procedures, different standards, and different graders. Consequently, it should be obvious to the admissions officer that direct use of college selectivity as a molar predictor of academic achievement is a tenuous proposition at best.

Finally, it is important to note a possible limitation of the research presented here. It is possible that the lack of significance on the medical school variables was attributable to either a homogeneous grading system, the similarity of the subjects in terms of their academic abilities, or a combination of these two factors. For example, it may be argued that the teaching and grading practices in medical school result in the production of medical students who achieve relatively equal measured levels of mastery. Or it may be said that since all the subjects were relatively equal in academic ability to begin with (as evidenced by similar scores on the MCAT and their acceptance into medical school), the absence of differential performance in medical school and on the NBME examinations comes as no surprise. However, although both of these concerns may be true, they in no way negate the basic point of the study. That is, if premedical GPA is considered only in its raw form, it might be erroneously concluded that differences in academic ability do exist among students upon entrance into medical school and may be expected to continue in their undergraduate medical performance. In fact, among accepted students such differences probably do not exist but appear to be due to the susceptibility of the GPA measure to extraneous sources of variation.

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Development and Validation of a Test Instrument For Assessing Value Preferences in Medical Ethics

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Abstract—A test instrument for assessing the preferences medical students display for six value categories—aesthetic, economic, political, religious, social, and theoretical—was developed using a case study approach. The major validation procedures involved the relationship of medical ethics values to general values and the differences of medical ethics values as expressed by six "known groups" of non-medical students. Data from 151 medical students and 274 students representing six groups were analyzed to provide information concerning social desirability, internal consistency, and test-retest reliability. The dominance of the social value category was supportive of research previously reported that physicians consider the social dimension of medical decision-making to be of primary importance. However, because of the dominance of the social value category with all respondents and the weak known group relationships, further study is recommended to define the components of the social value category within the medical ethics domain.

Rapidly expanding technology and pluralistic societal values have contributed largely to the proliferation of new ethical dilemmas in medicine. A newly emerging realization of the importance of ethics in medical decision-making has been reflected in the concern of today's medical schools. The concern has been evidenced by a steady increase over the past decade in the teaching of medical ethics, both in medical schools and universities. A survey in 1974 found 94 out of 107 medical schools that reported some specific form of medical ethics teaching. By comparison with 1972, 17 out of 95 schools had offerings in a special ethics category (1). The relative infancy of medical ethics teaching may explain the paucity of tools to evaluate these new teaching efforts.

Because the teaching of medical ethics is fast becoming part of the curriculum of many medical schools, an instrument that can aid in the evaluation of medical ethics curricula would appear to be useful. It might also prove helpful as an aid for values clarification, as a tool for counselors in career planning, and in research projects designed to measure the effectiveness of different teaching programs during medical school.

Moral values have been studied by philosophers for centuries. Yet there is no unified approach to a theory of values nor a single definition. Allport's definition of values seems to be most closely related to

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this study: "Personal values are the dominating force in life, and all of a person's activity is directed toward realization of his values." (2)

A MEDLINE and Educational Resource Information Center (ERIC) search of the literature identified only a few instruments and studies that related to the topic of how medical students or physicians solve ethical dilemmas. Crane's study (3) of physicians' attitudes toward critically ill patients presents evidence in support of the thesis that physicians evaluate terminally ill patients not only in terms of the physiological aspects of illness but also in terms of the ability of the patient to interact socially with others. The social dimension in medical decision-making was viewed as a determining factor in whether a physician will actively treat a critically ill patient. A few studies have applied Lawrence Kohlberg's moral development theory to investigate the level of moral judgment that physicians and medical students use in arriving at a moral decision (4, 5). Consideration of moral reasoning as the sole component of moral judgment may be an oversimplification of a complex process. Typically, in moral judgment research, no assessment is made of other values that may be relevant to an individual in a given situation (6).

There would appear to be a need for the development of valid and reliable instruments to evaluate value preferences in medical ethics objectively. The present study is concerned with the construction and validation of a medical ethics inventory that will provide profiles of the value preferences of medical students regarding a sample of bioethical dilemmas.

Instrument Development

The medical ethics inventory (MEI) was constructed by the authors at the State University of New York at Buffalo. The instrument was constructed upon the theoretical framework of values as described by Spranger in his book, *Types of Men: The Psychology of Ethics and Personality* (7). Spranger's theoretical framework of values is composed of six basic categories: aesthetic—interest in form and harmony; economic—interest in the useful and practical; political—interest in power, control, legality; religious—interest in unity and comprehension of the cosmos; social—interest in human relations; theoretical—interest in discovery of truth and knowledge.

The MEI was further based upon a conceptual model that categorized ethical problems as those that involve one or more of four moral themes: respect for human life, for individual freedom, for faithfulness in covenant relationships, and for equality (8). These themes were thought to be appropriate for use as a basis for categorizing medical ethics problems, because they represent an inclusive categorical system for almost all medical ethics problems.

A pilot study was conducted as a preliminary step in the formation of the MEI. Case studies as reported in medical journals and textbooks were used to compile a set of problems that were employed in an open-response test administered to a sample of 135 university students taking a course in medical ethics at McMaster University. Inspection of the responses supplied by respondents confirmed that Spranger's six categories were highly relevant. Several problems were found to be unsuitable for inclusion in the final instrument, because the range of responses was very limited. The final set consisted of 12 dilemmas. Six response choices similar to those which were supplied by respondents in the pilot study and which conformed to the Spranger value definitions were included for each dilemma. Six "judges" were chosen on the basis of their education and experience to represent each of the six value categories. It was presumed that each judge would score highest on the value category that the judge was chosen to represent. Scores from the six value subscales were used to form a value profile. The judges' value profiles were as predicted. For example, a social worker was found to have a predominant social profile. The judges also matched responses with definitions that represent the value categories. As a result of the judges' responses and comments, certain choices were altered to conform more closely to their suggestions.

The MEI consists of 12 medical ethics dilemmas, for which there are no right or wrong answers. Respondents are asked to rate all six value statements according to a five-point scale of importance. The MEI contains six subscales (each with 12 items) that correspond to the six values conceived by Spranger. Subscale scores were formed by summing responses to individual items; this created a range of possible scores for each subscale from 12 (low importance) to 60 (high importance). A sample problem* from the MEI follows:

> A concerned mother went to her family physician with her 14-year-old retarded daughter. The woman was upset to find out that her daughter had been sexually active with several boys at her special school. The mother wanted the child to be sterilized before pregnancy occurred. She was a widow who had three other children and told the doctor that she could not cope with raising any more children. If you were the family physician, how would you rate the following six choices in terms of importance to you for decision-making? (The ratings range from A, not at all important, to E, extremely important.)
>
> 1. The feelings and well-being of the daughter and the mother (social value category).
> 2. The medical history of the patient and the advantages and disadvantages of sterilization (theoretical).
> 3. The physician's responsibilities in view of the legality of performing the sterilization (political).
> 4. The projected costs versus benefits of the various options, for example, maintaining the offspring, performing future abortions (economic).
> 5. The procedure might be in conflict with a spiritual ideology (religious).
> 6. The child of a retarded mother would have a different style of life than of a normal mother (aesthetic).

Hypotheses

In order to establish construct validity for the MEI, two research hypotheses were formulated. One concerned the relationship of medical ethics values to general values, and the second one considered the differences of medical ethics values as expressed by six known groups of non-medical students.

Spranger's theories suggest that individuals rank order values as determined by a variety of mental (inner) complexities and life (outer) situations. He suggests that different inner and outer situations contribute to differing value systems. This would imply that values expressed in a specific context such as medical ethics may differ from values in a general context. Thus a major hypothesis for establishing the empirical validity of the MEI can be stated as: there is a relationship between general values and medical ethics values.

The Study of Values (SOV), developed by Allport, Vernon, and Lindzey (9), is based upon the six value categories suggested by Spranger. Because the SOV samples items from a variety of contextual settings, it produces value profiles of a "general" nature. Reliability and validity data in the test manual appear to be adequate for test purposes. The data for claims of validity and reliability cited in the 1970 manual are based on data collected in the 1950s. The 1970 revised edition updates the responses and supplies more contemporary examples. The theories of Spranger and the SOV instrument were selected as the basis for investigation of the construct validity of the MEI. Since both instruments (SOV and MEI) share the same six value categories, they should display similar factor structures (patterns). Differences should also be evident based upon the differences between general values and medical ethics values.

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* The entire instrument is available from the authors.

The modified form of the SOV used for the study reported here contained 15 items. Each value factor was represented by 10 responses. A rank order response format was used with the greatest preference being scored as 1 and the least as 4. A sample item from the modified SOV follows:

> When you go to the theatre, do you as a rule enjoy most: (*a*) plays that treat the lives of great men (political value category), (*b*) ballet or similar imaginative performances (aesthetic), (*c*) plays that have a theme of human suffering and love (social), (*d*) problem plays that argue constantly for some point of view (theoretical)?

Some investigators (9, 10) have theorized that persons in specific occupations have unique personality traits. Extensive research by Allport, Vernon, and Lindzey has shown that certain "known groups" produce predominant value profiles when administered the SOV. For example, clergymen have predominant religious and social value profiles, and medical students have predominant theoretical-political profiles. Based upon the research employing the SOV and the fact that the MEI is modeled upon the same six values, one might expect to find known groups displaying predominant value profiles when given the MEI. Such evidence would provide further construct validity for the MEI. Therefore, the second major hypothesis to be investigated is: there are differences between medical ethics values expressed by six known groups of non-medical students.

In addition to the two hypotheses, reliability, internal consistency, and social desirability for the MEI will be discussed.

Data Collection

Data were collected anonymously from four different groups of students. The first sample was 151 medical students from three medical schools (92 males and 59 females); they completed the MEI and the modified SOV. The medical school sample consisted of: 75 first-year medical students from McMaster University School of Medicine in Hamilton, Ontario; 16 first-year medical students from the State University of New York (SUNY) at Buffalo School of Medicine; and 60 second-, third-, and fourth-year students from University of Illinois Rockford School of Medicine, Rockford, Illinois.

The second sample consisted of 274 students from six known groups. There were 56 first-year law students and 41 commercial art students from SUNY at Buffalo; 39 students from McMaster University Baptist College; and 45 social work students, 33 chemical engineering students, and 60 commerce students from McMaster University.

The third sample was 90 first-year McMaster University psychology students, who took a test and a retest (after three weeks) of the MEI.

The fourth sample was a group of 80 McMaster University undergraduate students who were in a medical ethics class. They responded to the inventory and to Crowne and Marlowe's Social Desirability Scale (11).

Testing of all four samples was done in the fall of 1979, and responses were placed on machine-scoring answer sheets along with such biographical information as age, sex, religion, and university major. All students who participated in the testing devised anonymous identification numbers so that test-retest data could be matched and missing data collected. The instructions were self-explanatory, and approximately one hour was required for the respondents to complete all the test materials.

Results

Analyses failed to show significant differences in the means of the three samples of medical students. Therefore, the combined data from 151 medical students were used to compute histograms. These showed that normal distributions existed for each of the six categories of the MEI. A directional analysis was used based upon the inference that the MEI would correlate positively with the SOV, since both instruments share the same six values.

Inspection of the estimated means and standard deviations for the four sets of data indicated that a model to test the hypotheses that assumed equal variances and unequal means would be valid. All relationships were considered significant if the statistical tests used had a probability below the .05 level.

To test the first hypothesis, a canonical correlation analysis was performed. The canonical correlation analysis program, part of SUNY-Buffalo's Multiple Analysis Program System for Behavioral Science Research (12), was used. The combined data from 151 medical students are summarized in Table 1.

It can be noted from the table that the first pair of canonical variates had a statistically significant canonical correlation ($p < .01$). This accounted for approximately 38 percent of the variance that provided evidence for the existence of a relationship between medical ethics values and general values. The nature of the relationship can be inferred from a comparison of the variate structures of the two sets of variables in the canonical correlation analysis. It can be seen from the data in Table 2 that variate one in both sets is a bipolar factor between the economic and religious categories.

The other variates exhibited varied patterns that were not statistically significant. The first bipolar factor of the MEI and the SOV accounted for approximately 28 percent of the variance. It would seem from the data that the two instruments are related in some ways. Alternatively, differences exhibited between the two instruments may be due to specific values measured in different contextual situations. The medical ethics inventory when correlated with the SOV had a total redundancy of 8.6 percent, while the SOV correlated with the MEI showed 14.3 percent redundancy. (Cooley and Lohnes [13] define redundancy as used in this study.) These

TABLE 1

Estimated Proportion of Variance Extracted, Degrees of Freedom, Probability, and Chi-Square Test of Association for Six Canonical Variates of the Medical Ethics Inventory (MEI) and Study of Values (SOV) for 151 Medical Students at Three Schools

Roots Removed	Canonical R	R^2	Chi-Square	*df*	Probability
0	.62	.38	100.28	36	<.01
1	.37	.14	31.14	26	<.18
2	.18	.03	9.48	16	<.89
3	.16	.03	4.66	9	<.86
4	.08	.01	1.05	4	<.90
5	.03	.00	.15	1	<.70

TABLE 2

Variate Structures of 151 Medical Students for MEI and SOV

Variable	Variates					
	1	2	3	4	5	6
MEI						
Aesthetic	.010	.035	.232	.730	−.138	.626
Economic	−.433	−.232	−.585	.529	−.268	.258
Political	.121	−.529	.014	.687	.340	−.344
Religious	.778	−.217	−.223	.520	−.136	−.092
Social	.086	.654	−.129	.645	.347	.113
Theoretical	−.077	.250	.204	.706	−.459	−.425
SOV						
Aesthetic	−.370	.200	.629	−.549	−.061	−.350
Economic	−.555	−.203	−.050	.569	.413	.393
Political	−.188	−.473	.594	−.315	.533	−.070
Religious	.812	−.429	−.304	.068	−.216	−.113
Social	.593	.705	−.023	−.225	.120	.294
Theoretical	−.408	.422	.381	.380	−.184	−.575

small percentages of shared common variance indicated that the instruments differed in some ways. This difference may be attributed to the differing contextual situations inherent in the medical ethics cases. Thus, the two instruments showed a relationship to each other that can be taken as evidence for construct validity. Yet, the MEI has unique characteristics and structures that make it different from the SOV.

Further evidence revealing the nature of the relationship between the MEI and the SOV can be seen in Table 3, which displays the estimated means, standard deviations, rank, and correlations of the two instruments.

The six subscales of the MEI correlated positively with one another, whereas the six subscales of the SOV generally correlated negatively with one another. The SOV subscale intercorrelations from the present study closely match the data reported in the SOV manual (9). When the six subscales of the inventory were correlated with the same value categories of the SOV, three were found to have statistically significant positive correlations ($t_{(149)} = 1.65$, $p < .05$). These three are the economic, religious, and social subscales.

The rank order of subscales for both instruments showed some similarities. The social category was of greatest importance in both inventories. The economic and political values were viewed by respondents as least important. The aesthetic category was of moderate importance, with a rank of three for both instruments. The religious and theoretical categories were in fourth and second place for the MEI and changed to second and fourth place for the SOV. These similar ranks of the value categories for both inventories lends further support to the construct validity of the MEI. It should be noted that the previously established norms (9) for the 1951 edition of the SOV reported medical students' ranked profiles as theoretical, political, aesthetic, religious, economic, and social. This discrepancy between the earlier normed data (1951) and the data obtained in the present study may be a reflection of changes in societal values over the last three decades.

A multivariate analysis of variance procedure (14) was used to test the hypothesis that there are differences between specific medical ethics values and known groups. As noted previously, a sample of 274 subjects participated in this phase of the study,

TABLE 3

Estimated Means, Standard Deviations, Rank, and Correlations of MEI and SOV Variables for 151 Medical Students

Variable	Mean	S.D.	Rank	Correlations											
				A	E	P	R	S	T	A	E	P	R	S	T
MEI															
Aesthetic (A)	41.16†	5.1	3	1.00											
Economic (E)	32.08	5.9	6	.44	1.00										
Political (P)	35.45	5.3	5	.22	.35	1.00									
Religious (R)	39.43	6.0	4	.29	.13	.36	1.00								
Social (S)	51.17	4.8	1	.49	.16	.16	.23	1.00							
Theoretical (T)	43.63	5.7	2	.37	.24	.36	.31	.38	1.00						
SOV															
Aesthetic	25.83‡	4.0	3	−.10	.10	−.07	−.21	−.01	−.04	1.00					
Economic	22.02	4.0	5	.06	.21*	.15	−.21	−.01	.05	−.28	1.00				
Political	21.50	4.2	6	−.03	−.01	.09	−.11	−.16	−.07	−.23	.18	1.00			
Religious	26.72	5.8	2	−.01	−.14	.03	.45*	−.05	−.07	−.18	−.44	−.26	1.00		
Social	30.17	4.1	1	−.01	−.24	−.21	.21	.19*	.00	−.05	−.43	−.35	.11	1.00	
Theoretical	24.15	4.3	4	.05	.06	.01	.21	.10	.13	−.00	.04	−.07	−.50	.23	1.00

* Correlation ≥.14 is significant ($p < .05$).

† Values related to response system with maximum score 5.

‡ Values related to response system with maximum score 4.

which involved six known groups of non-medical students who completed the medical ethics inventory. The overall multivariate test for the hypothesis was significant ($F_{(30,1054)} = 4.27$, $p < .001$). The means, standard deviations, and rank of the six groups are in Table 4.

It can be seen from the data that only two of the six groups were identified by high scores on the expected corresponding value category. The religion students had statistically significant higher scores on the religious subscale than any of the other five groups ($t_{(268)} = 3.37, p < .01$), and the social work students showed statistically significant higher scores on the social subscale ($t_{(268)} = 3.83$, $p < .01$). The null hypothesis of no differences among the known groups was accepted, because the MEI was not able to differentiate between most of the groups.

The relationship showed that all six groups had very similar profiles. The social value was chosen most frequently, theoretical second (except for the religion students), political fifth, and economic last. There appears to be commonality in the way these six academic groups responded to the medical ethics problems. These results imply that there were similar perceptions in approaching medical ethical dilemmas that transcend educational background. The social factor in the MEI appeared to override individual and group values.

The dominance of the social value in the MEI led to an investigation of the presence of social desirability as a factor in the instrument that could account for the unexpected results. A sample of 80 university students taking a course in medical ethics was administered the MEI and Crowne and Marlowe's Social Desirability Scale (11). This scale purports to identify individuals who describe themselves in socially desirable terms in order to achieve the approval of others. The reported valid-

TABLE 4

Estimated Means and Standard Deviations of Six Known Groups of 274 Non-Medical Students from Three Institutions for MEI Scales

Group	Aesthetic		Economic		Political		Religious		Social		Theoretical	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Art	40.32	5.73	33.51	8.70	36.63	6.04	41.54	7.02	49.41	4.08	47.07	6.05
Commerce	39.63	5.50	30.93	6.23	36.53	6.20	38.27	4.66	47.40	4.59	44.48	5.38
Law	38.36	5.53	31.38	7.58	35.91	5.19	37.91	6.82	47.75	5.99	44.79	5.42
Religion	39.28	4.84	29.03	6.52	34.10	6.79	43.28*	7.06	46.49	6.72	38.90	5.97
Social Work	41.98	5.36	30.42	6.99	35.36	6.74	40.67	5.72	51.07*	4.71	45.31	4.84
Engineering	38.12	7.06	30.39	7.73	37.72	4.52	40.00	5.70	47.88	4.86	44.33	5.05

* Significant at .01 level.

ity and reliability for this scale seem adequate.

The correlation between the social desirability scale and the social subscale of the MEI was not significantly different from zero. Similarly, the other MEI scales did not correlate significantly with the social desirability scale. This information would indicate that the MEI is not testing social desirability, as measured by the Crowne and Marlowe scale.

A measure of internal consistency for the MEI was obtained from the combined sample of 151 medical students. Coefficient alphas for the six subscales were: aesthetic, .459; economic, .671; political, .606; religious, .566; social, .652; and theoretical, .653. These values reflected modest internal consistency considering that each scale was composed of only 12 items.

Test-retest reliability for the MEI was established using a sample of 90 first-year psychology students. Pearson product-moment correlation coefficients were computed. The test-retest scores correlated positively for each of the six subscales and exhibited adequate reliability. The following values were obtained: aesthetic, .71; economic, .74; political, .72; religious, .82; social, .70; and theoretical, .65.

Discussion

The results reported here present adequate reliability and modest internal consistency for the medical ethics inventory. The existence of a relationship between medical ethics values and general values was explored by using a canonical correlation analysis. This analysis revealed one pair of similar factors for the medical ethics inventory and the SOV. There was a generally positive correlation for each subscale of the MEI with the corresponding subscale of the SOV. Three of these correlation coefficients were statistically significant. The rank order of values for both instruments indicated similar patterns. This was also true for the sample of known groups, where there were similar ranks for the six values of the inventory. This evidence is supportive of the construct validity of the MEI.

The small percentage of shared common variance was cited as evidence for the differences between the two tests.

From the analysis of the hypothesis that known groups displayed different value profiles, one can conclude that only two groups responded with the predicted profiles (social and religious). This was not sufficient to reject the null hypothesis. The similarity in the rank orders of the six values by the known groups can be interpreted to mean that decision-making in the medical ethics domain appears not to be related to academic background. Although the concept of known groups may still be relevant in some contexts, the unanticipated findings regarding these different groups show that medical ethics decision-making may not be conceptualized as a simple function of the behavior of so-called known groups.

Conclusion

Limiting factors in this study include: the sample size and selection, problem selection, validation procedures, and the general problems involved in the use of self-report instruments. These limitations may have contributed to the findings and conclusions. Variance between seemingly divergent known groups was not obtained; therefore, detecting any statistically significant within-group variance would appear to be unlikely. The results presented here tend to confirm those reported by Crane (3) that physicians consider the social dimension of medical decision-making to be of primary importance. Using a sample of students from various educational settings, the present investigators found that all respondents consider the social value factor the most important. Further research is needed to represent the components of the social dimension of medical ethical decision-making and to proceed with the development of instruments in the area of medical ethics.

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Nurses in Medical School

Debra Gussman

Abstract—Each year more nurses are accepted into medical school. They bring a unique background and an already established philosophy of patient care. Thirty-three nurses currently enrolled in medical school completed questionnaires that focused on their motivation for a career change and their projected specialty preference. Most nurse-medical students were motivated for a career change because of a desire for increased patient responsibility. Most students expressed interest in primary care specialties. There was a close association between employment experience as a nurse and projected specialty preference as a doctor.

Medical students have been the subjects of many studies. A small subset of medical students, however, has escaped close scrutiny. They are nurses who have opted to expand their education and the scope of their practice by matriculating in medical school. They bring to medical school an educational background different from that of most of their classmates and an already established philosophy of patient care.

A questionnaire was designed to gather information about such students' original decisions to study nursing and their subsequent decision to pursue a medical career. Information was also collected concerning their work experiences in nursing and their projected specialty preferences.

Methods and Data

In 1980 the author sent letters to student affairs offices at 20 medical schools selected randomly requesting assistance in the form of posted notices in an effort to make contact with nurses enrolled in medical school. Students interested in participating contacted the author for a questionnaire. These students provided the names of additional nurse-medical students. Eventually the names of 43 nurse-medical students were obtained, and they were mailed open-ended questionnaires. Limited assumptions can be made concerning the representativeness of this sample.

Biographical and attitudinal information was requested. The subjects were all graduates of nursing school and had obtained registered nurse or licensed practical nurse certification before entering medical school. The questionnaire was completed by 33 of the nurses. The unusually high response rate apparently reflected the subjects' interest in this study. The information was analyzed as to content and was grouped by response. A nurse-medical student often made several different statements in answering a question, and not all questions were answered by all subjects.

Students from 18 schools responded. There were two male and 31 female respondents. The average age of the nurse-

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medical student was 28.4 years. Ten were freshmen, eight were sophomores, four were juniors, and 11 were seniors. All 33 students had undergraduate degrees; 23 had a bachelor of science in nursing, seven a bachelor of science degree, and five a bachelor of arts degree. Two students had two undergraduate degrees. Nine had pursued advanced education; five had a master's degree in nursing, and four had nurse practitioner certification.

Questions and Findings

Eleven respondents chose nursing out of a desire to help people. Eleven included among their reasons for becoming a nurse an interest in biology, science, or health. Nine became nurses because they felt that women who wanted health careers went into nursing while men went into medicine. Seven chose it as a marketable skill. Six saw nursing as an inexpensive educational opportunity. Four mentioned a close personal experience with illness as a motivating factor. Five had nursing thrust upon them by family expectations. Three discussed favorable role models. One chose nursing in case she did not get into medical school. One was influenced by the children's novels about nurse Cherry Ames, and one wanted to become a midwife.

Twenty-six nurse-medical students were motivated to enter medicine for reasons that centered on a desire for responsibility. Of these, 12 wanted responsibility for patients and control of patient care. Ten discussed medicine as a route to having autonomy and independence of practice. Four desired control, power, and influence over the health care team.

Seventeen students wanted medical knowledge. They wanted to learn about pathology and physiology. Of these, four stated they wanted to learn "how to diagnose and treat." One wanted to learn how to operate.

Sixteen indicated that motivations were tied to issues of status and personal challenge. Six wanted more recognition and felt that a medical education would increase their status in the eyes of others. One student applied to medical school because of the boost it would give her self-esteem if she were accepted. Nine nurse-medical students felt medicine represented a challenge they wanted to meet.

Thirteen nurse-medical students expressed a desire to help people as a reason for wanting a medical career. Four wanted to be better patient educators, five wanted increased earning power, and one wanted research opportunities.

When asked about their primary area of interest, the breakdown of medical specialty preference was as follows: family practice, 8; internal medicine, 7; obstetrics and gynecology, 6; surgery, 3; pediatrics, 3; psychiatry, 3; emergency medicine, 2; and critical care, 1. Several students listed other possibilities in addition to their primary choice. Pathology, radiology, and academic medicine were considered by one student each. There was a 70 percent association between work experience as a nurse and primary career choice as a physician.

Discussion

In the past several years the number of nurses applying to medical school has been steadily increasing (Table 1). A sample of nurses who are currently enrolled in medical school was polled. Attention was focused on the following topics: initial interest in nursing, desire for a career change to medicine, and projected career goals.

Most nurse-medical students chose nursing for conventional reasons. These reasons included a desire to help people, an interest in science, a desire for a marketable skill, and personal and family expectations and experiences. These motivations closely paralleled those motiva-

TABLE 1

Nurse Applicants to Medical School, 1975–76 to 1979–80

Nurse Applicants	1975–76	1976–77	1977–78	1978–79	1979–80
Number	206	215	239	256	271
Percent of applicant pool	.4	.5	.6	.7	.7
Number accepted	48	63	77	90	104
Percent of nurse applicants accepted	23.3	29.3	32.2	35.2	38.4

Source: Annual editions of *Medical School Admission Requirements*, published by the Association of American Medical Colleges.

tions of nursing students described by Smith (1) and by Morris and Grassi-Russo (2). In this age of women's liberation, it was surprising to find that 27 percent of the nurse-medical students chose nursing for the traditional reason that women interested in a health career pursued a career in nursing and that men with similar interests followed a path to medicine.

The nurse-medical students gave more than 20 different reasons for wanting to study medicine. Their responses could be grouped into four main categories: a desire to control patient care, an opportunity to obtain medical knowledge, a desire to help people, and a desire to achieve status in the community or to increase self-esteem. These motivations were similar to those presented by freshman medical students described by McDermott (3) and the motivations of female medical students by Cartwright (4). They were also similar to the reasons the same students originally chose nursing, with one exception: the desire to control patient care and to guide the direction of the health care team. It is ironic that the issue of autonomy should surface in a time of increasing regulation of medical practice. The scope of practice is now influenced by hospital administration, government agencies, insurance companies, and precedents set in malpractice litigation. There is also increasing regulation from within the medical community by peer review groups. The focus on independence in practice may serve as a source of future disillusionment for this group of medical students.

Historically, women in medicine have selected specialties such as pediatrics and psychiatry. They have been poorly represented in surgery and the surgical subspecialties. Braslow and Heins (5) divided the female resident pool by specialty training. Internal medicine had the largest proportion of women with 24.3 percent. Surgery and surgical subspecialties attracted 9.1 percent. Psychiatry was second with 11.7 percent. The nurse-medical students showed interest in these three areas in similar proportions, with 21 percent being interested in internal medicine, 9 percent interested in surgery, and 9 percent interested in psychiatry. However, there were several specialty preferences among the nurse-medical students that were markedly different from the distribution of female residents. The most common career choice among the nurse-medical students was family medicine, with 24 percent of the students describing it as their primary career choice. This is in contrast to only 8 percent of the female resident pool. Another area is obstetrics and gynecology, where 18 percent of the nurse-medical students expressed interest as compared with 9.4 percent of the female residents. The nurse-medical students did not show much interest in one area of medicine that has traditionally attracted female doctors: 20.1 percent of female residents were in pediatrics, but only 9 percent of the nurse-medical students described pediatrics as their primary choice.

There was a notable lack of interest by nurse-medical students in areas such as clinical pathology, radiology, and anesthesiology, areas that involve 16.6 percent of the female residents. The nurse-medical students may not have considered these options for several reasons. Many of the students who participated in this study had not reached the fourth year when electives in these areas are offered. Also, these students indicated a preference for direct patient care. The specialties mentioned, although very important for patient care, are more geared toward physician consultation rather than direct patient needs. A third factor was the lack of nursing equivalent for pathology, anesthesiology, and radiology. Nurse-medical students were attracted to areas in which they had had experience as nurses.

The group was predominantly interested in clinical practice. Seventy-three percent of the nurse-medical students expressed interest in areas traditionally associated with primary care. Only one student mentioned academic medicine as a career possibility. This may also be a reflection of the strong association between work experience as a nurse and projected career expectations.

Admission committees should consider the possible advantages of recruiting nurses into medicine. Nurses have experience in applying scientific knowledge to patient care. They bring a "care" oriented background to the "cure" oriented traditions of medicine. They have indicated a strong commitment to patient care. A follow-up study should be done on the nurse-medical students' career choices. If the association with nursing experience persists or if primary care areas dominate their career selection, they might provide one means of rectifying the manpower maldistribution of medical specialties.

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A Required Course in Decision-Making For Preclinical Medical Students

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Abstract—Objectives, methods of instruction, and evaluation of a preclinical course in decision-making are described in this article. One set of objectives that related to learning to read and write clinical algorithms was taught by having students read a clinical algorithm about a problem, solve a patient management problem about the problem, and write an algorithm. A second set of objectives that related to learning clinical decision analysis was taught by solving problems and discussing them. Three methods used to evaluate three classes showed the following results: large increases in taped interview problem (TIP) scores after learning algorithms, high mean scores on a final examination that tested all course objectives, and high voluntary class attendance. It is concluded that preclinical medical students can be taught cognitive decision-making skills, that the TIP is a promising tool for measuring such skills, and that careful monitoring of a course in clinical decision-making may provide valuable information regarding learning and teaching clinical management.

Medical decision-making has traditionally been taught mainly in the clinical years, either at the bedside or in case-oriented seminars. In many schools a preliminary approach to decision-making is taught in seminars that begin in the preclinical years and that attempt to correlate basic science principles with clinical phenomena (1). Almost always, however, such preclinical seminars aim to teach clinical data evaluation and principles of differential diagnosis rather than diagnostic and therapeutic decision-making. Principles of decision-making are generally taught in an elective course, if at all.

The field of medical decision-making has two main directions. First, Ledley and Lusted (2) pioneered the application of mathematical decision theory to medical problems. This approach, which may be termed clinical decision analysis, has been described in a textbook by Weinstein and colleagues (3), and its applications to health care have been reviewed by Krischer (4). Second, Tuddenham (5) and the editors of the journal, *Patient Care*, began to construct clinical algorithms (flow charts) for guiding patient management. Use of medical algorithms has been reviewed by Feinstein (6) and has led to widespread use of algorithm-based protocols by paramedical and medical person-

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nel to guide and audit care of specific medical problems (7). The course described here was aimed at teaching both principles of clinical decision analysis and algorithmic analysis of clinical decisions.

The curriculum at the Faculty of Health Sciences of the Ben-Gurion University of the Negev in Israel differs from traditional curricula in that all curriculum content is introduced at several points during the six-year course of studies, each time at a higher level of sophistication (8). Clinical work, for example, starts during the first week of the first year with a course on the natural history of disease that begins with the practice of interviewing and simple physical examination skills in the hospital, in the clinic, and in the patient's home.

The authors decided to apply the principle of early introduction of curriculum content to the area of medical decision-making. They sought and gained faculty support for a required eight-session course in medical decision-making to be given during the third and last preclinical year (roughly equivalent to the second year in an American medical school). This paper describes the course and its evaluation during the first three years that it was given (1977–1979).

Goals and Objectives

The goals of the course were to teach preclinical medical students to construct and use clinical algorithms and to apply principles of clinical decision analysis. Specific objectives were as follows:

Algorithm objectives—At the end of the course, the student was expected to identify the effects of the environment, information, the patient, and the physician on a medical decision; read clinical algorithms; construct a clinical algorithm to solve a problem not learned in the course; and show a significant increase in knowledge of how to manage a set of medical problems in one clinical area (for example, neonatology).

Decision analysis objectives—At the end of the course, the student was expected to define the following concepts used in decision theory and solve problems using these concepts: probability; the decision process, including objectives, state, action and outcome variables, consequences and value functions; risk and risk aversion; values, utilities, and costs, including expected values; decisions under conditions of certainty, risk, and uncertainty; dominance; estimating probabilities, including subjective measures and estimating utilities; value of information; and decisions that relate to individual patients versus decisions that relate to the public.

Instructional Methods

Bruner (9) has observed that a method of instruction must be suited to the nature of the subject. It follows that a method that will enable the preclinical medical student to learn how to make clinical decisions must allow him to practice making clinical decisions. On the one hand, the student must make specific medical decisions, since the processes of medical problem-solving and decision-making are dependent on problem or decision content (10). However, he must make a variety of decisions in order to learn general principles of decision-making. The following instructional methods, all of which enabled the student to practice making clinical decisions, were used in this course.

Algorithm learning—For the first half session (one hour), students toured the newborn unit. The tour sought to define concretely for the student such unfamiliar terms as "bilirubin light" or "oxygen analyzer" by demonstrating diagnostic and therapeutic maneuvers employed while caring for newborns. Then, during the first hour of three two-hour sessions, algorithms in neonatology were read, at first together with a clinical instructor and then alone by the student, who used the instructor as a consultant. During the second hour of these three sessions, the student solved a newborn management problem (NMP), which simulated a patient with the same problem, and compared his solution with that of the neonatologist (11).

An NMP is a type of patient management problem that allows the student to choose any diagnostic or therapeutic maneuver in any order (11). NMPs are based on Helfer's (12) diagnostic management problems. NMPs differ from traditional patient management problems in that they do not limit the student's choice to categories (for example, history, physical examination, laboratory tests), and they enable the student to record the sequence of choices within a category.

During the fourth session (two hours) students constructed an algorithm to solve a problem of their choice in an area of practice other than neonatology.

For the third class taking the course, the first of three clinical algorithms and matching management problems dealt with a primary care rather than a newborn problem. This change was instituted because success of the first two classes at learning NMP content caused students, instructors, and other faculty members to suggest that at the Ben-Gurion school, which has a special goal of training primary care physicians, at least some of the course should be taught in the context of primary care.

Decision analysis problem-solving—Concepts were presented in printed notes with examples that were handed out before class and then discussed. No attempt was made to present theoretical notions of preference relationship or other aspects of the mathematical justification and proof of various statements. At times the students themselves raised some of these issues and were referred to appropriate literature and/or discussion after class. Such detail was avoided because of the limited mathematical background of many students.

Evaluation Methods

Student achievement and course success were evaluated by three methods.

Taped interview problems—Before and after most of the algorithm-NMP learning sessions, the class was tested using the same taped interview problem (TIP) which assessed knowledge of how to manage the problem learned in the algorithm. The form of the TIP was suggested by the clinical problems that are frequently posed orally to students by expert clinicians in order to test the student's clinical acumen. A TIP is a series of taped clinical vignettes, all related to a single clinical problem and followed by the question, "What would you do?" Taped presentation of a developing patient problem prevents cueing the student to answers from information supplied at earlier stages of the problem. The student is asked not to erase answers he has already finished (13). In order to test long-term retention, the asphyxia TIP was administered again, without warning, at the end of the newborn rotation week of the pediatric clerkship, one year after the end of the course.

Written examination—A written examination consisted of seven open-ended questions, five on clinical algorithms (50 points) and two on decision analysis (50 points). Of the first five questions, two were case problems taken from the asphyxia and normal newborn TIPs that required solutions contained in the algorithms learned in class; one was a new jaundice case problem that required a diagnostic decision learned in class; one required the student to list the four factors (physician, patient, knowledge, environment) influencing the decision in the jaundice question; the last question required the student to construct his own algorithm for a child presenting with red urine, a history of impetigo, and facial puffiness. The first decision analysis question required the student to analyze formally a decision regarding a patient with pharyngitis and fever, to construct a value table for the possible outcomes, and to indicate which decision should be preferred using criteria for decision-making in conditions of uncertainty. The second question asked the student to decide, assuming specified conditions and costs, whether it was worth sending a throat culture for every patient presenting with sore throat.

Class attendance—Since class attendance was optional (as it is for all nonclinical courses), it was used to estimate nonobtrusively (14) course acceptability.

Evaluation Results

Pretest and posttest results are given in Table 1 for four TIPs given to class 1, three of which were also given to class 2 and one of which was given to class 3. There were large gains for all problems in all three classes. The fact that standard deviations are large is probably due to relatively high scores of experienced medical corpsman and students who had worked as nurses in each group. Mean score on the asphyxia posttest increased 143 percent when compared with the pretest. When repeated one year later it had increased only another 18.5 percent, from a mean of 58.5 (S.D., 22.3) to a mean of 69.3 (S.D., 10.2).

Results of the written examination are shown in Table 2. The examination was administered to class 1 in the middle and at the end of the course and to classes 2 and 3 at the end of the course. At the end of the class 1, class 2, and class 3 courses, students achieved average scores of 65.6, 57.2, and 48.5 percent respectively. For all

TABLE 1

Pretest and Posttest Results* for Four Taped Interview Problems Presented to Three Consecutive Medical Classes, Ben-Gurion University, 1977–1979

Class	Normal Newborn					Asphyxia					Seizures					Jaundice				
	No.	Pretest		Posttest		No.	Pretest		Posttest		No.	Pretest		Posttest		No.	Pretest		Posttest	
		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.
1	27	56.52	24.77	74.0	29.8	28	24.1	15.0	58.5	22.3	29	14	13.7	61	24.7	23	10.7	5.78	21.0	8.0
2	30	41.47	26.20	69.68	20.7	26	33.5	17.9	64.81	14.4	24	7	8.2	63.03	24.06					
3	27	33.04	16.63	68.57	17.4															
Total	84	44.85	23.10	71.07	24.01	54	28.1	16.26	60.09	19.6	53	11.28	11.8	61.7	24.4					

* Maximum grade = 100.

TABLE 2

Written Examination Results for Three Consecutive Medical Classes, 1977–1979

Class	No.	Algorithm Questions*		Decision Analysis†		Whole Examination‡	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1977–mid course	30	36.9	7.3	32.6	11.5	69.5	15.1
1977–end course	30	36.83	5.74	29.16	14.01	65.6	17.7
1978–end course	28	33.8	9.51	26.62	13.23	57.16	21.3
1979–end course	33	25.6	5.65	22.9	9.89	48.5	12
Total§	91	31.8	7.08	27.03	12.4	56.8	17.2

* Maximum = 50 percent.
† Maximum = 50 percent.
‡ Maximum = 100 percent.
§ Refers to end-course results only.

three examinations, this score was the result of roughly equal achievement for the algorithm and decision analysis halves of the examination. In addition, scores on specific questions showed roughly equivalent achievement on all of the questions. Class 3 scores on all questions were lower than for the previous two classes.

Two-thirds of the class generally attended the algorithm sessions (range, 60 to 100 percent; mode, 70 percent), which compared favorably with attendance in other courses. Students were always alert and involved in reading algorithms and doing NMPs. However, only a small group of more mathematically oriented students seemed involved in the decision analysis sessions, and attendance after the first session was less than 40 percent.

Discussion

The main purpose of this paper is to demonstrate that medical decision-making can be taught successfully to preclinical medical students. Although evaluation data are presented, due to variations in class attendance, TIP data are incomplete. However, these data are not to be viewed as the results of a scientific experiment but rather as the results of a methodical evaluation of student achievement and as an indicator of course success.

An explanation of the term "decision-making" is in order. Originally, the course was called "clinical judgment." However, clinical judgment implies a consideration of the general medical problem-solving process as elucidated by Elstein (10) and Barrows (15), as well as a consideration of work on the relationship of medical knowledge to problem-solving (16). Some of these concepts were referred to; but since they did not constitute course objectives, the course name was changed to "medical decision-making," which seems to describe course content more accurately. This new, more restrictive definition, however, also made the authors realize that psychosocial aspects of decision-making (17) had not been covered in the course. These aspects were to be discussed in the 1981–82 course.

Although algorithms have been repeatedly criticized for encouraging rigid thinking, learning to use algorithms constitutes a major part of the course. An exhaustive discussion of this criticism would be inappropriate here. However, the authors feel strongly that work with nonmedical algorithms (18), as well as experience with algorithm learning by paramedics and physicians, shows that algorithms help students both to define their thinking more clearly and to prevent clinical errors. Algorithms probably increase rather than decrease flexible thinking.

From the large increases observed in TIP posttests as compared with pretests and from the high final examination scores on questions 1, 2, and 4, it was concluded that preclinical medical students learned from algorithm-NMP sessions to manage a variety of newborn problems. These results are consistent with results of a pilot study carried out with third-year clinical clerks in the United States (13). However, it cannot be concluded from the results here either that management skills will be used outside the classroom (that is, that clinical performance is improved) or that another more traditional method of learning, such as from a text, a lecture, a case presentation, or from bedside rounds, is any less effective. Algorithms have been shown to be superior to text that describes nonmedical decisions (18). A controlled trial is, therefore, in progress, using TIPs as the dependent variable that will compare algorithms and matching NMPs with text.

Another question that cannot be answered using present data is to what extent learning to manage one newborn problem improves skill at managing a different newborn problem or another pediatric problem. Although medical management skill has been described as being largely problem-specific (10), the authors hypothesize, as others have, that within a specific clinical area (for example, newborn, adolescent, cardiology), learning to manage a problem will to some extent improve management of another problem. This hypothesis could be tested by an experiment that would vary the sequence in which algorithms matched with NMPs are learned within and between clinical areas and would test for differences using TIPs.

The persistent high mean score on the asphyxia problem is evidence that knowledge of managing newborn asphyxia taught with algorithms and NMPs may be retained for a long period. Sharp tapering of the increase in the asphyxia TIP score after a newborn clerkship that purported to teach about asphyxia may be explained either by ineffective teaching during the clerkship or by teaching that did not add to what was taught in the medical decision-making course. Retention of learning from algorithms and NMPs should be tested for other problems and compared with other teaching methods, since longer retention might be an important advantage of learning with algorithms and NMPs.

Final examination questions on factors influencing a medical decision, writing a new algorithm, value analysis, and cost analysis were not pretested. However, in view of the fact that the subject matter required to answer these questions is not taught in any prior course and in view of the almost total ignorance of the subject demonstrated initially by the students in class, it seems likely that classes 1 and 2 were successful in learning the concepts tested.

Lower grades for class 3 were probably due to the following changes in the instructional method. First, since the tour of the newborn unit was dropped because of lack of time, the introduction to strange terminology was limited. Second, learning about newborn problems was diluted by learning about primary care problems. Third, discussions about decision analysis were curtailed because of lack of time.

The data support three conclusions. First, preclinical medical students can be taught cognitive clinical decision-making skills using clinical algorithms and matching NMPs; they can be taught to write algorithms; and they can learn clinical decision analysis. Second, the TIP shows promise as a simple, cheap measure of cognitive management skill, and its reliability and validity should be determined. Third, careful monitoring of a course in clinical decision-making may provide information and stimulate hypotheses regarding learning and teaching medical decision-making.

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COMMUNICATIONS

Medical Student Attendance at Lectures: Effect on Medical School Performance

Robert M. Sade, M.D., and Martha R. Stroud

In recent years failure of large numbers of medical students to attend lectures in the basic sciences during the first two years of medical school has become an important problem at the Medical University of South Carolina (MUSC) College of Medicine. Students rationalize their behavior by insisting that many faculty members are ineffective teachers who present poorly organized lectures that are uninteresting and too laden with facts. They further claim that they can best learn the required material by independent study, though there exists no formal independent study program like those in other institutions (1).

Many faculty members, on the other hand, allege that students are not sophisticated enough to be able to determine the value of information contained in lectures and that they generally underestimate the future value of the basic sciences in their medical careers. Some believe that attendance at lectures should be mandatory.

Discussion of these problems generally is driven by emotion; few data exist to judge the educational value of attending lectures. The best way to answer many of the questions raised would be with a prospective, randomized study, assigning students to a lecture attendance group or to a nonattendance group. The logistics of such assignments would be almost impossible to enforce, however, in the setting of a medical school. An attempt, therefore, has been made to collect the data that can be extracted from existing records. However, it is recognized that the retrospective nature of the study would weaken any conclusions that might be reached.

Methods

The class presidents of the 1979–80 sophomore (166 students) and junior (159 students) classes in the MUSC College of Medicine were asked to generate, in whatever manner they believed most accurate, a list of students in their classes who attended more than 95 percent of lectures (attendees) and a list of those who attended less than 5 percent of lectures (nonattendees) during their first and second years of medical school. The presidents each compiled their lists by consulting with classmates who they knew attended classes most of the time. The lists were kept confidential; the group to which each student belonged was encoded, and the code was known only to the statistician. Data collected on each student included grade-point average (GPA) in undergraduate college and the first two years of medical school, the score on the Medical College Admission Test (MCAT), and the score (for juniors only) on Part I of the examination of the National Board of Medical Examiners (NBME-I).

There were 85 attendees and 52 nonattendees in the two classes. These groups were compared in two different ways. With analysis of covariance, the GPAs in the first and second year of medical school and the scores on NBME-I, adjusted for undergraduate college GPA and for MCAT score, were compared. For two-way analysis of variance, members of the attendee group were matched with members of the nonattendee group who had a similar college GPA, thus generating 43 matched pairs of attendees and nonattendees. It was not possible to match all students because of unequal distribution of scores. The groups were also paired by MCAT scores and compared.

Results

There was no significant difference between attendees and nonattendees in mean college GPA (3.45, S.E.M., 0.03, versus 3.51, S.E.M., 0.05) or in mean MCAT scores (52, S.E.M., 1, versus 51, S.E.M., 1). Interestingly, there was poor correlation between college GPA and

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TABLE 1

Mean and Standard Error of Mean of Medical School GPA and NBME-I Scores for Medical Students Classified as Lecture Attendees and Nonattendees, Matched for Premedical College GPA and MCAT Scores, Medical University of South Carolina

Pairings	Attendees		Nonattendees		p*
	Mean	S.E.M.	Mean	S.E.M.	
College GPA					
First-year GPA	3.01	0.09	2.74	0.01	< 0.05
Second-year GPA	3.13	0.08	2.86	0.09	< 0.05
NBME-I	539	19	442	20	< 0.0005
MCAT					
First-year GPA	2.94	0.09	2.80	0.09	< 0.05
Second-year GPA	3.12	0.09	2.80	0.09	< 0.01
NBME-I	515	19	440	21	< 0.05

* Probabilities based on two-way analysis of variance for differences between medical school GPA and NBME-I scores of attendees and nonattendees.

MCAT score ($r = 0.0963$, $P > 0.05$). To rule out unequal distribution of scores between attendees and nonattendees, the shapes of distribution curves of college GPAs and MCAT scores were compared using the chi-square test of independence. In both cases, there were no significant differences of distribution between the groups.

Two-way analysis of variance of matched pairs demonstrated that attendees scored significantly higher than nonattendees in all categories (Table 1). Analysis of covariance, using college GPAs as well as MCAT scores as covariates, produced a nearly identical result.

Discussion

It is clear that students at the school who have chosen to attend lectures during the first two years of medical school perform significantly better in GPA and NBME-I than students who have chosen not to attend, even when corrections are made for premedical college performance. Interpretation of these conclusions is difficult, however, because the study was retrospective. A major confounding factor is that the students were not randomly assigned to each group; rather, they decided to attend or not to attend classes for reasons unknown to the investigators.

The greatest objection to this study, however, lies in the measures used to compare the effects of lecture attendance. In the authors' view, the purpose of a student attending medical school is not to have a high GPA or to score well on board examinations but to leave medical school with all of the intellectual and moral equipment to be an excellent physician (2). The sparse available data relating grade to later career performance suggest little correlation between them (3). Until better methods of evaluating the effect of medical education on performance appear, investigators will have to be content with the inexact predictors of professional performance that are available.

GPAs and board examinations, despite their limitations, influence the future of most students, to wit, their use by some state boards for registration purposes and by many hospitals in evaluation of house officer candidates. Medical students would do well to heed this message: under the conditions described in this study, students who performed equally in college have significantly higher GPAs and NBME-I scores in medical school, for whatever reasons, if they attend lectures regularly than if they do not.

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Divergent Pediatric CME Priorities in a Rural Area

Jerome P. Rosenthal, Ph.D., and Tim C. Miller, M.D.

Continuing medical education (CME) in general and pediatric CME in particular remain elusive in both their mandate and their implementation. Both are being addressed with increasing objectivity; however, attempts at providing pediatric CME in metropolitan communities and their adjoining rural catchment areas pose unique problems. Some of these problems have previously been identified: lack of communication between the university medical center and rural physicians, lack of coverage for solo practice physicians while attending CME programs, travel distances, variable motivation, and failure of CME courses to meet individual needs (1).

In an attempt to document the possible factors leading to these difficulties more fully, the authors conducted a survey of pediatricians in the 23-county North Central Perinatal Region in Illinois about their "perceived" continuing medical education needs. They were asked by questionnaire to rate 32 subject areas according to the importance they assigned each subject in their own continuing medical education. The subjects selected were based on a list of "subspecialty interests named by pediatricians as those they currently emphasize or would like to emphasize" that was compiled by the Committee on Manpower of the American Academy of Pediatrics (2). The rating scale was 1 to 3 with 1 being "not needed" and 3 being "needed."

The pediatricians in the region were divided into three major groups on the basis of their practice location in relationship to the University of Illinois College of Medicine Peoria School of Medicine: hospital or school-based pediatricians in Peoria; local or office-based pediatricians in Peoria; and rural pediatricians or those in the 23-county region outside of Peoria. Rural pediatricians were further defined as those who were practicing in communities more than 30 miles from the teaching center, had no local subspecialists available, and had primary affiliations with hospitals delivering fewer than 1,000 babies each year.

The numerical ratings received for each CME subject were averaged for each group of pediatricians, and comparisons were made of the importance assigned to the CME subjects within each group and of the differences in "perceived" CME needs among the groups.

In addition, the total group responses for all 32 CME subjects were again averaged to obtain the overall level of group response. The overall level reflects the degree of intensity, or interest, that each group places upon continuing medical education in its practice.

High priority topics were arbitrarily defined as those topics receiving an overall group response of 2.4 or greater. All statistical comparisons were made by using the Student's *t*-test for independent samples.

Results

Seventy-eight percent of all pediatricians surveyed responded to the questionnaire. The large response for a survey of this nature is attributable to the close working relationship of one of the authors with the pediatricians in the region afforded by an active perinatal outreach program.

The hospital/school-based pediatricians gave high priority to relatively few CME topics, such as allergy and immunology, adolescent medicine, and behavioral pediatrics, whereas the local/office-based pediatricians, in addition to the preceding topics, gave high priority to dermatology, delinquency and drug abuse, pulmonary disease, and metabolic disease. Of all these topics, only delinquency and drug abuse was given a low priority status by the rural pediatricians. In addition, 11 other topics were rated high by the rural pediatricians: infectious

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disease; learning disabilities; neonatology; accidents, poisoning, trauma; gastrointestinal disease; endocrinology; neurology; nutrition; genitourinary disease; growth and development; and musculoskeletal system.

Significant differences in perceived need were demonstrated between pediatricians practicing in a rural setting and all pediatricians practicing in a community associated with a university center. The topics which were significantly different ($p \leq 0.05$) were: cardiology, genitourinary disease, infectious disease, learning disabilities and school adjustment problems, neonatology, and pulmonary disease. All of these topics were given a greater priority by the rural pediatricians than by the other two groups. However, no significant differences were demonstrated in the ratings of these topics by the two groups of Peoria pediatricians. It was also observed that far more topics were expressed as needed by the rural pediatricians than by either group of Peoria pediatricians. Indeed, it appears that more topics were perceived as a high priority need as the distance between the pediatricians and the teaching center increased.

Discussion

The dissemination of new medical information underlies the development of any CME project. This task is even more formidable when the setting is rural.

Just as the distribution of health manpower into rural areas remains a problem in health care delivery, so does the flow of medical information to the health care teams in these same areas. This flow of information might be interrelated to the point of influencing manpower distribution. At a minimum, in order to have effective CME, the flow must be present and uninterrupted.

Continuing medical education has been defined as encompassing the following educational elements: identification of needs, learning objectives, teaching methods, and evaluation of learning outcomes. These elements have traditionally been defined at and implemented from the university and/or teaching hospital setting. Commentary on this process has already started, and to some extent the dialogue has begun to address rural educational concerns (3, 4). Miller (5) has referred to the gap between academia and the front-line troops.

As an initial step in achieving the first of these educational elements, needs-identification, in Illinois, improved communication with rural pediatricians was generated by an active perinatal outreach program in the North Central Perinatal Region. The experience of this program and of others (6, 7) has shown close communication to be an effective method of determining the educational needs of rural physicians.

The results of the present study have pointed up significant differences in perceived needs as the pediatrician's practice became more physically distant from the university/hospital teaching center. The rural pediatricians expressed an increased desire for CME in pediatric subspecialties and for those problems commonly seen in a rural office setting. It is, therefore, important that comprehensive CME programs developed on the basis of survey results, such as presented in this communication, address the expressed needs of all the groups surveyed.

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Recognition of Anxiety and Depression By Residents in a General Medicine Clinic

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Anxiety and depression are frequently found in patients presenting for medical care (1–5). In an effort to improve house staff recognition of psychosocial factors in medical care, the present investigators studied the prevalence of anxiety and depression in clinic patients, the ability of residents to identify these affects, and the accuracy of patients' responses to simple written questions about anxiety and depression.

Methods

A study population of 207 patients was drawn from 625 patients attending the University of Virginia Internal Medicine Walk-In Clinic over a five-week period. The clinic is staffed by resident physicians with faculty supervision. The overall walk-in clinic population is 51.8 percent Caucasian and 41.7 percent black. The mean age is 38.8 years. The population is 54.4 percent female. The sample population was comparable statistically with these characteristics ($p > 0.1$).

All patients presenting with a new complaint were invited to participate in the study. Patients were excluded if they: (*a*) arrived while the interviewer was with another patient; (*b*) arrived when a physician was immediately available to see them; (*c*) declined to participate; (*d*) were incapable of understanding the test questions; or (*e*) expressed current suicidal ideation.

All patients were seen by one interviewer, a third-year medical student. Interviews were conducted while the patient waited to see his physician. Physician assessment of the patient's anxiety and depression was obtained after each visit.

The SCL-90, developed by Derogatis (6), is a 90-item symptom checklist that assesses nine psychological parameters. The two subtests for anxiety and depression were combined and used as a 23-item checklist. The criteria for clinical abnormality for the SCL-90 are an adjusted score greater than 0.63 on at least two scales of the test.* Therefore, patients had to score above the cutoff point of both scales in order to be judged abnormal. In addition, patients and physicians were each asked to rate on separate 100-millimeter-line scales their assessment of the patient's level of anxiety and depression. Scores of these assessments were classified as abnormal if they were above the 50 millimeter point.

Results

Fifty-two patients scored above 0.63 on both scales for a frequency of combined anxiety and depression of 25.1 percent. Patient self-assessments and resident assessments were compared with SCL-90 results. Patient's self-assessments were more strongly associated with the SCL-90 subtest scores than were resident's assessments (chi-square = 49.71, $P < .0001$ and chi-square = 5.58, $P = 0.018$ respectively).

Patient self-assessments and physician assessments were also compared with the SCL-90 subtest results using the concepts of sensitivity and specificity (7). Patient self-assessment

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* Personal communication, L. R. Derogatis, Ph.D., associate professor of medical psychology, Johns Hopkins University School of Medicine, March 13, 1980.

alone yielded a sensitivity of 51.9 percent, and the sensitivity for resident alone assessment was 26.9 percent. When either patient or resident judged the patient abnormal, sensitivity rose to 61.5 percent. When specificity was examined, patient assessment alone yielded a value of 92.3 percent and resident assessment a value of 87.1 percent. If both patient and physicians judged the patient normal, specificity rose to 98.7 percent. Predictive values were calculated. If a patient indicated he was abnormal, 69.2 percent of the time he was correct; if he indicated he was normal, he was correct 85.1 percent of the time. Comparable figures for resident assessment were 41.2 percent and 78.0 percent. If both patient and resident agreed the patient was abnormal, they had a 81.8 percent chance of being correct; if both thought the patient normal, they were correct 86.2 percent of the time.

Discussion

The study found over 25 percent of the walk-in patients in a university medical center to be anxious and depressed. When asked to identify these patients, residents only identified 26.9 percent. When patients were asked to report their own anxiety and depression, however, their answers correctly identified 51.9 percent of abnormal patients.

Others have likewise shown a high prevalence of anxiety and depression in medical patients. Gross and colleagues, using the Center for Epidemiological Studies Depression Scale, studied 189 outpatients at a university hospital. They found 37 percent of the patients to be depressed (3). Linn and Yager found 42 of 100 patients screened with the Zung Self-Rating Depression Scale in a medical ambulatory care center to be depressed (5). Glass and colleagues, using the Hopkins Symptom Checklist, a precursor of the SCL-90, found that 38 percent of the patients in a university hospital outpatient medical clinic had a psychiatric disorder (2).

Others have also found that medical residents have difficulty in diagnosing anxiety and depression. Gross noted his residents were able to diagnose depression correctly in only 30 percent of patients (3). Brody found residents scored only slightly better than chance in diagnosing anxiety and depression in 149 medical clinic patients who had been administered the General Health Questionnaire (4).

Is recognition of anxiety and depression important in patient care? Snyder and colleagues found that female patients with higher average levels of depression had more problems in effectively communicating their illnesses to their physicians than less depressed women (8). Goldberg, in a study conducted in a prepaid setting, demonstrated decreased utilization of services after identification of psychosocial problems (9). Physicians who do not recognize anxiety and depression may be misled by the symptoms associated with these affects and embark on unnecessary diagnostic work-ups or dispense unnecessary medication. Such actions may convince patients that they have serious diseases, further exacerbate anxiety and depression, and lead patients to increase their demands for further studies.

The study on which this communication is based showed that combinations of patient and resident assessments are more accurate than either alone, indicating that residents are able to identify some illness patients ignore. How can residents' diagnostic talents be cultivated? One approach would administer paper and pencil tests for anxiety and depression to all patients before they see their physicians. While giving the results of these tests to residents improves their notation of these problems in the medical chart, it is not known whether this strategy would improve medical care (5). A second approach would teach residents to ask their patients whether they are anxious and depressed. The results of the study suggest that asking the patient would be a useful intervention. However, some anxious and depressed patients, in response to a direct question, deny their feelings. Possible methods to enhance resident recognition of anxiety and depression in such patients include training in the recognition of nonverbal cues, training in interviewing techniques, and limited experience with office psychotherapy.

In summary, while this study shows a 25.1 percent prevalence of anxiety and depression in outpatients and documented poor physician recognition of these affects, it also raises several questions. Can house staff physician's ability to recognize anxiety and depression be improved through training? Can it be improved by providing the physician with the results of a patient questionnaire? Will improved recognition lead to changes in the quality of care provided? Better understanding of the role of emotional factors in illness and enhanced recognition of these factors by young physicians offer the promise of more appropriate and more cost-effective care in the future.

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Evaluation of Medical Student Training in Family Assessment

Maureen Leahey and Karl Tomm, M.D.

Physicians should be able to recognize situations where family relationships play an important role in precipitating or aggravating problems in their patients. Hence, medical students should receive some training that would enable them to assess family interaction to determine when it is influencing somatic or emotional complaints. The literature pertaining to methods of educating medical students in family assessment is sparse (1–4). In a review of family therapy training programs, Beal (5) points out that most centers lack sufficiently designed conceptual frameworks of family functioning. Liddle and Halpin (6) cite a major need for the development of measurement instruments. The present communication describes a training program for developing skills in family assessment at the medical school at the University of Calgary, Alberta, Canada. It also reports on a study evaluating the effectiveness of varying teaching methods.

The Calgary Program

A course entitled The Family in Health and Illness is provided during the latter part of the first year and entails a two-hour teaching session each week for three months. Teaching methods employed in the course include lec-

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tures, videotape demonstrations of family interaction patterns, readings, small group discussion, role-playing, family-interviewing, student case presentation in small groups, and panel discussion of topical issues. The major focus of the course is family assessment. The conceptual model being taught is based largely on the family categories schema which was first developed by Nathan Epstein, John Segal, and Vivian Rakoff in 1968 and later published by Epstein, Bishop, and Levin (7). The second author of the present paper added the structural and developmental life cycle parameters to the model.

After one or more introductory lectures, the class is divided into small groups of eight students. Each group has two preceptors. One preceptor has a medical background (family physician or pediatrician) and the other a psychosocial background (family therapist, psychologist, social worker, sociologist or psychiatrist). The physician preceptor assigns families from his practice, provides background information, and facilitates student contact with the family. His presence in the small group tends to ensure that the concepts discussed are relevant to medical training. The psychosocial preceptor helps students recognize how a patient's beliefs, feelings, and behaviors may be a function of interaction patterns in the family system. The early small group sessions are devoted to analyzing edited videotapes of clinical family interviews. Preceptors encourage students to make comments about their observations to expose their biases. During one session students practice specific family interviewing skills, for example, stimulating interaction between family members. Each student is then expected to interview a family and present his assessment to the group along with his raw data base (in the form of a videotape of his actual interview). Other students in the group are encouraged to give feedback on the presenter's interviewing skills as well as on his conceptualization of the family process. Subsequently, a formal written summary of the assessment is reviewed by the preceptors.

The remainder of the course consists of a few whole class sessions focusing on issues such as single-parent families and the impact of illness on the family. The former may employ panel discussions, a videotape demonstration, or live family interviews in front of the class.

Logistic Considerations

The small group teaching method was implemented because the course managers felt that student dialogue and direct experience with families would provide a more effective learning experience than didactic lectures. However, with a class of 72 students, 72 families and 18 preceptors are required for the nine groups. In addition, videotape equipment and facilities must be provided. Thus, this teaching program is rather expensive in terms of involvement of the faculty, expenditure of student time, and use of audiovisual resources. Both faculty members and students expressed widely discrepant opinions with respect to the relative efficacy of various aspects of the teaching methods used. This led to the decision to compare the effectiveness of three methods of teaching family assessment by carrying out a specific study.

Research Study and Results

The class of 1979 was randomly divided into thirds, and each was exposed to a different teaching protocol for the first six weeks (12 hours of instruction time). Method one employed traditional classroom lectures along with demonstration videotapes prepared by the faculty. Method two used small group discussion and the same videotapes. Method three also used small groups but incorporated an experiential task in which the students conducted a family interview and presented their own videotapes to the group for discussion.

Measurement instruments were required to evaluate the student's perceptual and conceptual skills in family assessment. Since no instruments were known to be available in this specific area, separate pretests and posttests composed of short answer and essay-restricted questions were devised. Each test took 65 minutes to complete. Part A was related to the family assessment theory, while Part B was related to clinical family problems. Five segments of videotape depicting family interaction formed the basis for Part B. Two independent experts familiar with a systems model of family assessment judged the degree to which the tests measured what they intended to measure (face validity). One specialist was an educational psychologist and associate director of the Family Therapy Program, University of Calgary. The other expert was a family practitioner and manager of the course, The Family in Health and Illness. They evaluated content validity by judging the sampling adequacy of the questions in relation to the course objectives and the reading material. In addition, test question objectives were matched against Bloom's *Taxonomy of Educational Objectives* (8). The tests were judged valid. An attempt was also made in a separate substudy to ensure that the pretest was parallel with the posttest. Statistical equivalence was established for Part A and for the total test but not for Part B.

A prestudy questionnaire was devised to gather data on possible confounding variables such as the student's age, sex, marital status, and previous work experience in mental health or related areas. A poststudy questionnaire inquired about satisfaction with the teaching methods.

The results showed a significant gain in scores between premeasures and postmeasures. However, the gains did not differ significantly among the three teaching methods (9). That is, despite the greater logistics entailed in organizing small groups, interviews, and videotapes, the students involved did not show appreciably greater achievement on the measurement instruments. Women scored significantly higher on Part A (knowledge) and total scores but did not gain significantly more than men from pretest to posttest. Methods one and two students were also significantly more satisfed with their learning experience than were method three students. That is, those students who were in small group sessions and had to present their interview of a family reported the least satisfaction.

There were many limitations to the study. The instruments did not measure changes in student attitude nor changes in executive skill among the students who interviewed a family. Only conceptual and perceptual skills were evaluated by the instruments.

Following this study, a few changes were made in the course. For the first six weeks when family assessment concepts are taught, method one alone (lecture with faculty-prepared videotape demonstration) is now used. Once the initial "front-end loading" of theoretical material is given and students have an opportunity to develop basic perceptual and conceptual skills, the class is divided into small groups to practice family interviewing skills. Students are then expected to apply their assessment skills in interviewing a real family and in presenting it to their group for discussion. Thus, the intuitive judgments of course managers continue to carry the most weight in determining which teaching methods are used. The study did, however, have an impact on time allocations and sequencing. Perhaps most significantly, it enhanced student and faculty awareness of issues related to teaching efficacy.

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EDITORIAL

Faculty Promotion and Tenure

An article in this issue of the journal by Dr. Gjerde summarizes the perceptions of faculty members and department chairmen toward customary academic and institutional activities of individual faculty members that are often considered in evaluation for promotion and tenure. Among the 69 items rated by chairmen and faculty members, there were significant differences in 12. Faculty members in this study tended to rank highest those items related to research. The department chairmen reinforced the concept of research effort as an important requisite for promotion but also emphasized teaching, patient care, and contributions to the administrative and service needs of the department or school. Although Dr. Gjerde's report is limited to the insights of faculty members at only one medical school, I suspect little disagreement would be found among faculty members in other schools.

From 1955 to 1975, when existing medical schools were expanding rapidly and new schools developing, it was easier for faculty members to receive both promotion and tenure. Additional faculty members were needed at most established institutions, and there were ample alternative opportunities for faculty members at the developing medical schools. Discord between a department chairman and an individual faculty member was painful, but faculty members usually had prospects for advancement and tenure at an institution aggressively seeking new faculty.

Such is not true today. Medical schools are in a state of retrenchment. Revenue from all sources has decreased or leveled off. In many medical schools, promotion from assistant to associate professor is often accompanied by the award of tenure, which represents a long-term financial commitment by the school.

The issue of promotion and tenure will likely become more contentious than it has been. Faculty members have always sought promotion as recognition of their academic efforts. Tenure today also implies financial security at a time when job opportunities are significantly reduced for young medical school professors. The department chairman has no choice but to review carefully the faculty members proposed for the precious few tenured positions he has available. The responsibility for managing a department demands more than just the chairman's recognition of the faculty's research. Departments are responsible for teaching and patient care, and their members should participate in the governance and daily administration of the school through service on admissions, promotion, curriculum, and other committees.

Logically, if the perceptions of the faculty members and chairmen differ on consequential issues relating to promotion, this should be recognized in advance by a discussion between the participants. Gjerde proposes a job description for each faculty member. This would be reviewed annually in a meeting of the faculty member and his department chairman. In this way, there would be no misunderstanding as to the responsibilities of the young professor, and there would be acknowledgement of his successes and failures by his chairman. Certainly this process would mitigate the problem of imbalanced perceptions of the faculty members aspiring for promotion and tenure.

Most chairmen and deans of medical schools easily identify good professors among their tenured faculty members. What separates good from ordinary faculty members is difficult to characterize. In the book, *The Right Stuff*, Tom Wolfe investigated the selection of test pilots and astronauts. He was unable to describe clearly what separated the very best from the remainder. He labeled that specific feature of the most successful performer as the "right stuff." Having the right stuff was indicative of doing well under stress and constantly striving to improve one's performance. Today, medical schools more than ever need a faculty that is intellectually versatile and personally committed to the missions of the school. These faculty attributes, which are characteristic of those receiving promotion and tenure at the outstanding medical schools in this country, often elude precise definition.

The recognition and award of tenure to faculty members probably does more than anything else to determine the character, the vitality, and the quality of a medical school. To become tenured, faculty members participate in another admissions process. The process should be fair. Because it derives from human judgment, it is always imperfect. I support the discussion of promotion and tenure guidelines between department chairmen and faculty members. It is reasonable for a faculty member to want to understand what is expected of him by those who are judging his performance. It is oversimplification, however, to reduce this to a job description with annual reviews as the monitoring process.

RICHARD C. REYNOLDS, M.D., *chairman, Editorial Board*

DATAGRAM

Women Faculty Members at U.S. Medical Schools

During the past three years, the number of U.S. medical school full-time faculty members grew from 41,161 to 46,265, an increase of 12.4 percent. The proportion of the faculty members consisting of women increased from 15.2 percent in 1978 to 16.2 in 1981. The significance of this full percentage point increase in three years is pointed up by the fact that during the 10-year span of 1968–1978 the proportion of faculty members who were women increased by only 1.9 percentage point.

The growth in the total number of faculty members over the three-year period is based on individuals receiving their first full-time faculty appointment at a medical school. Of the 5,104 new appointees, 1,251, or 24.5 percent, were women; thus one out of every four newly hired full-time faculty members was female.

TABLE 2

U.S. Medical Schools with More Than 25 Percent Full-Time Female Faculty Members, 1981

School	Percent Female
Medical College of Pennsylvania	37.6
New York Medical College	32.2
University of Illinois College of Medicine	30.5
University of Puerto Rico School of Medicine	29.8
Meharry Medical College School of Medicine	28.0
Albert Einstein College of Medicine of Yeshiva University	27.8
University of Maryland School of Medicine	26.1
Columbia University College of Physicians and Surgeons	25.1

TABLE 1

Composition of Full-Time Faculty Members at U.S. Medical Schools by Degree and Sex

Faculty Members	1977–78	1980–81	Difference	Percent Increase
Males				
M.D.-Ph.D.s	1,833	2,091	258	14.1
M.D.s	21,728	24,233	2,505	11.5
Ph.D.s	9,360	10,428	1,068	11.4
Other health doctorates	347	365	18	5.2
Non-doctoral	1,262	1,353	91	7.2
Unknown	382	295	−87	−22.8
Total	34,912	38,765	3,853	11.0
Females				
M.D.-Ph.D.s	102	124	22	21.6
M.D.s	2,546	3,134	588	23.1
Ph.D.s	1,775	2,307	532	30.0
Other health doctorates	30	34	4	13.3
Non-doctoral	1,667	1,817	150	9.0
Unknown	129	84	−45	−34.9
Total	6,249	7,500	1,251	20.0

The distribution according to the degrees of the newly hired faculty members is shown in Table 1. The increase in male faculty members during this period was 11 percent, whereas the increase in female faculty members was 20 percent.

Although the figures show a continuing increase in the proportion of full-time women faculty members at U.S. medical schools, the distribution of these female faculty members is uneven. Forty-seven medical schools have over 17 percent full-time women faculty members; 23 of these schools have over 20 percent, and eight of the schools (Table 2) have more than 25 percent.

These data are derived from the Faculty Roster System at the Association of American Medical Colleges. Since more women have been recruited in recent years, slow reporting by some schools has resulted in a lower recorded percentage for women, not only for the school in question but also, to a lesser extent, for all schools in the aggregate.

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Association of American Medical Colleges
Annual Meeting
and
Annual Report
1981

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The Ninety-Second Annual Meeting

Washington Hilton Hotel, Washington, D.C., October 31–November 5, 1981

Theme: Tomorrow's Medicine: Art and Science or Commerce and Industry?

Program Outlines

PLENARY SESSION

November 2

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From Four Perspectives:

The Biomedical Scientist:
The Alan Gregg Memorial Lecture
David M. Kipnis, M.D.

The University President:
Donald Kennedy, Ph.D.

The Industrialist:
Business and Medicine: The Pursuit of Human Health
John W. Hanley

The Public:
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The Responsibilities and Obligations
Charles Crawford

November 3

Presiding: Thomas K. Oliver, Jr., M.D.

Presentation of AAMC Research and Flexner Awards

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Disease Prevention and Health Promotion
Richard S. Schweiker

Chairman's Address:
'The Idea of a University'
Julius R. Krevans, M.D.

SPECIAL GENERAL SESSION

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ACADEMIC FUNCTIONS IN AN INCREASINGLY COMMERCIAL HOSPITAL ENVIRONMENT

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Panel: Commercial Stress on the Academic Medical Center
Robert M. Heyssel, M.D.

Development of Investor-Owned Hospital Groups and the Implications for Traditional Medical Centers
Donald S. MacNaughton

Respondents: G. Richard Lee, M.D.
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Samuel O. Thier, M.D.

COUNCIL OF ACADEMIC SOCIETIES

November 1

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BASIC SCIENCE EDUCATION AS THE FOUNDATION FOR ADVANCED MEDICAL PRACTICE

Presiding: Daniel X. Freedman, M.D.

The Content and Scope of Instruction in Pharmacology: Past, Present, and Future
Frederick E. Shideman, M.D.

Identification of Essential Bioscience Concepts: The Challenge for Basic and Clinical Scientists
Rubin Bressler, M.D.

November 2

Science in Medical Practice in the Year 1990
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Presiding: Daniel X. Freedman, M.D.

COUNCIL OF DEANS

November 2

Business Meeting
Chairman: Steven C. Beering, M.D.

COUNCIL OF TEACHING HOSPITALS

November 2

Business Meeting
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Presiding: Mitchell T. Rabkin, M.D.

Implementing Competition in a Regulated Health Care System
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Ricardo Azziz, M.D.

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Central
Western
Southern

Preventing Impairment and Failure of Medical Students
Carola Eisenberg, M.D.
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Joan May
Steve Phillips

Assessment of Clinical Performance: Improving the State of the Art
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Business Meeting

November 1

DISCUSSION SESSION

Clinical Evaluations: The Unwritten Rules
George Baker, M.D.
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November 2

Tomorrow's Medicine: The Economy,
The Science, The Practice

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Panel: Jeff Goldsmith, Ph.D.
Jane Henney, M.D.
Alvin Tarlov, M.D.

WOMEN IN MEDICINE

November 1

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Moderator: Roberta A. Monson, M.D.

AAMC Tenure Study and General Issues of Tenure and Promotion
Amber B. Jones

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Faculty Concerns
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Michela Reichman

On Scientific Grounds
Barbara J. Norris

Pen and Pencil vs. The Camera
Ann Harrell

A Reporter's Perspective
Judy Randall

An Interviewee's Perspective
N. Lynn Eckhert, M.D.

A TALE OF O

A presentation of *A Tale of O*, a slide-tape show based on Dr. Rosabeth Moss Kanter's research for her award-winning book, *Men and Women of the Corporation*. The slide-tape demonstrates what happens to any minority individual in a work group.

DAUGHTERS OF SCIENCE

A slide-tape show from the Archives of the Medical College of Pennsylvania

Discussion Leader: Eva Ray, Ph.D.

COD/SOCIETY OF MEDICAL COLLEGE DIRECTORS OF CONTINUING MEDICAL EDUCATION

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INFORMATION TECHNOLOGY: IMPLICATIONS FOR MEDICAL EDUCATION

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Donald A. B. Lindberg, M.D.

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Martin M. Cummings, M.D.

Continuing Medical Education: Can We Change the Paradigm?
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The Role of Communication Satellites in Information Technology
M. Roy Schwarz, M.D.

FACULTY ROSTER WORKSHOP

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GROUP ON BUSINESS AFFAIRS

November 3

Financial Questionnaire Workshop

Regional Meetings:
South
West
Midwest
Northeast

November 4

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Robert B. Price

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John A. D. Cooper, M.D.

Priorities and Health Policies
Edward N. Brandt, Jr., M.D.

The Support of Biomedical Research by Industry

Moderator: John A. Gronvall, M.D.

Speakers: David A. Blake, Ph.D.
Howard W. Bremer

Coping with Agreement
Jerry B. Harvey, Ph.D.

CARROLL MEMORIAL LECTURE

Federalism and the University Medical Center
Steven C. Beering, M.D.

Business Meeting
Presiding: Jerry E. Huddleston

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November 1

COMPETITION IN THE HEALTH CARE INDUSTRY: IMPACT ON ACADEMIC MEDICAL CENTERS IN THE 1980s

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Moderator: Peter W. Butler

Speaker: Honorable Richard A. Gephardt

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John W. Colloton

Medical School Perspective:
Ronald P. Kaufman, M.D.

Planner's Perspective:
Jeff C. Goldsmith, Ph.D.

November 2

Business Meeting
J. Stephen Smith, Chairperson

Regional Meetings

GROUP ON MEDICAL EDUCATION

November 1

SPECIAL SESSION

THE ASSESSMENT OF HOUSE STAFF PERFORMANCE

Developed in conjunction with the Association of Program Directors of Internal Medicine and the Society of Teachers of Family Medicine

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Overview: Xenia Tonesk, Ph.D.

Panel: Family Medicine
Hiram B. Curry, M.D.

Internal Medicine
William L. Morgan, M.D.

Surgery
Frank E. Rosato, M.D.

November 2

INNOVATIONS IN MEDICAL EDUCATION EXHIBITS

SMALL GROUP DISCUSSIONS

THE FUTURE ROLE OF MEDICAL SCHOOLS IN CONTINUING MEDICAL EDUCATION

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Panel: Donald Brown, M.D.
Richard M. Caplan, M.D.
John M. Dennis, M.D.
Robert H. Moser, M.D.

CURRICULUM REVIEW AND REVISION: THE PROCESSES AND PRESSURES

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FOSTERING THE DEVELOPMENT OF THE ACADEMIC PHYSICIAN

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Panel: Robert C. Combs, M.D.
Barry Stimmel, M.D.
James Van Vooren

CLINICAL REASONING (PROBLEM SOLVING): TEACHING AND EVALUATION

Moderator: Howard S. Barrows, M.D.

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ORGANIZING MEDICAL EDUCATION FOR THE ADULT LEARNER: WHY, WHEN AND HOW?

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THE GEOGRAPHIC AND SPECIALTY MALDISTRIBUTION OF PHYSICIANS: DO THE STRATEGIES OF THE 70s MEET THE NEEDS OF THE 80s?

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Will R. Galey, Ph.D.
Eugene S. Mayer, M.D.
Wayne W. Myers, M.D.
Benjamin B. C. Young, M.D.

QUALITY CONTROL OF CLINICAL EDUCATION IN COMMUNITY HOSPITALS AND CLINICS

Moderator: Michael J. Gordon, Ph.D.

Panel: Charles P. Friedman, Ph.D.
Gerald B. Holzman, M.D.
Marcia Z. Wile, Ph.D.

SENIOR YEAR—PURPOSES/STRUCTURE

Moderator: Roger O. Lambson, Ph.D.

Panel: Fredric D. Burg, M.D.
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November 3

INNOVATIONS IN MEDICAL EDUCATION EXHIBITS

Regional Meetings:
Central
Southern
Northeast
Western

INNOVATIONS IN MEDICAL EDUCATION DISCUSSION GROUPS

Instructional Design or Evaluation of Introduction to Clinical Medicine Experiences
Moderator: Paula L. Stillman, M.D.

Instructional Design or Evaluation of Clinical Clerkships
Moderator: Marilyn Heins, M.D

Instructional Design or Evaluation of Residency Programs
Moderator: Philip G. Bashook, Ed.D.

Instructional Design or Evaluation of Continuing Medical Education Programs
Moderator: David Allan, M.D.

Computer Applications in Medical Education
Moderator: Michael G. McShane, Ph.D.

Interdisciplinary Health Education
Moderator: Leonard E. Heller, Ed.D.

Faculty Development
Moderator: Hilliard Jason, M.D.

Educational Support Systems for Students
Moderator: Miriam Willey, Ph.D.

Innovative Approaches to Admissions and Student Financial Aid
Moderator: Jerry R. May, Ph.D.

November 4

PLENARY SESSION

Combined Session with the Group on Student Affairs

THE EXTERNAL EXAMINATIONS DILEMMA: IMPACT ON EDUCATIONAL PROGRAMS AND STUDENT BEHAVIOR

Moderator: Murray M. Kappelman, M.D.

Participants and Perspectives:

Should External Examinations Be Used as Gateposts for Promotions?
Fredric D. Burg, M.D.

The Comprehensive Qualifying Examination—Pro and Con
Daniel D. Federman, M.D.

Impact of External Examinations on Students' Attitude and Behavior
Robert I. Keimowitz, M.D.

Evaluating Curriculum by Means of External Examinations
T. Joseph Sheehan, Ph.D.

A Student's Perspective on External Examinations
Louis van de Beek

GME NATIONAL MEETING

Regional Summaries of Discussion of AAMC General Education of the Physician Project

GSA-GME SPECIAL SESSION

Evaluating the Use of MCAT Scores in Admissions

Moderator: Robert L. Beran, Ph.D.

Panel: Frances R. Hall
Thomas E. Norris, Ph.D.
George A. Nowacek, Ph.D.
Virginia I. Nunn, Ed.D.

Discussant: Robert F. Jones, Ph.D.

GME/SOCIETY OF MEDICAL COLLEGE DIRECTORS OF CONTINUING MEDICAL EDUCATION

November 2

APPROACHES TOWARD ENHANCING THE QUALITY OF CONTINUING EDUCATION OF HEALTH PROFESSIONALS

Moderator: George E. Miller, M.D.

Quality Defined by:

Health Care Practitioner
C. H. William Ruhe, M.D.

Provider of Programs and Services
William H. Young, D.Ed.

Accreditor
Richard S. Wilbur, M.D.

CESP MODEL—Theory and Practice
Joseph S. Green, Ph.D.
David B. Walthall, M.D.

Action Plans—Panel and Audience:

VA: Management and Reporting System and Learning Packages
Kenneth Lawrence

Center for Educational Development
University of Illinois
Ronald W. Richards, Ph.D.

Office for Research and Development for Education of Health Professionals, University of North Carolina
William Wood, M.D.

Summary
George E. Miller, M.D.

GROUP ON PUBLIC AFFAIRS

November 1

PUBLIC AFFAIRS IN A TIME OF CHANGING VALUES

Orientation Session

Presiding: Kay Rodriguez

Speakers: John F. Sherman, Ph.D.
GPA Officers

November 2

Welcome Breakfast

Moderator: Suzanne Rauffenbart

Speaker: Florence Janovic

HEALTH: A COMMON EFFORT

Speaker: Edward Brandt, M.D.

COMPETITION LEGISLATION

Panelists: John Crosby
Richard Knapp, Ph.D.

November 3

SHRINKING RESOURCES: THE IMPACT ON THE ACADEMIC MEDICAL CENTER

Speakers: John D. Chase, M.D.
Thomas J. Kennedy, Jr., M.D.

TRACK I—PUBLIC RELATIONS

MANAGING THE EFFECTIVE MEDICAL PUBLIC RELATIONS PROGRAM

Speaker: Fred Gehrung

PRESENTING MEDICINE ON NETWORK TELEVISION: A PRODUCER'S PERSPECTIVE

Speaker: Bud Lamoreaux

TRACK II—ALUMNI

ALUMNI RECORDS

Moderator: Perry Culver, M.D.

Panelists: Muriel B. Sawyer
Clifford Ohle

ALUMNI DIRECTORIES

Panelists: Dorothy Estes, M.D.
Katherine Walker

INCORPORATION OF NON-ALUMNI RESIDENTS AND FELLOWS

Panelists: Penny Hackley
Sharon A. Sweder

TRACK III—DEVELOPMENT

PERSPECTIVES ON MEDICAL CENTER DEVELOPMENT—SHARPENING THE FUND RAISER'S TOOLS

Moderator: Robert Hart

Panelists: Anthony Bridwell
E. Burr Gibson
Richard Janeway, M.D.

November 4

WORKING BREAKFAST

New Media for Conveying Your Message

Discussion Leaders: Dean Borg
Doug Buck

How to Get on the Op Ed Page and Other Places You've Never Been Before

Discussion Leaders: B. J. Norris
Suzanne Rauffenbart

Handling Controversial Matters—Some Advice from Those Who Have Been There

Discussion Leaders: Vicki Saito
Roland Wussow

The News-Making Hospital Patient

Discussion Leaders: Kathryn Costello
Al Hicks

How to Get Publicity for Your Hospital in an Overhospitalized Town

Discussion Leaders: Shirley Bonnem
Jane Snyder

Making the Best of Your Publication

Discussion Leaders: Robert Fenley
Thomas Lake

Campaign Marketing and Feasibility Studies

Discussion Leader: Robert Pierpont

Staffing and Salaries of the Academic Medical Center Development Office

Discussion Leader: John Ford

Raising Money for Capital Equipment for Medical Schools for Clinical and Academic Purposes

Discussion Leader: Seymour Alpert, M.D.

A Place or Role for Alumni in the Promotion of Public Relations and Development for Teaching Hospitals and Medical Schools

Discussion Leader: Perry Culver, M.D.

AWARDS NOMINEE PRESENTATIONS

Presiding: Vicki Saito

Publications

Michela Reichman
H. Taylor Vaden

Special Public Relations/Development/Alumni Project

Don Clayton
B. J. Norris

Electronics Program—Audio

David Ogden
Ric Spiegel

Electronics Program—Visual

Barbara Austin
Jane Peters Snyder

Total Public Relations/Development/Alumni Program—Affiliated Teaching Hospital

Dean Borg
Roland Wussow

Total Public Relations/Development/Alumni Program—Medical School and/or University Hospital

Robert Fenley
Joe Sigler

GPA BUSINESS SESSION

Presiding: Kay Rodriguez

AWARDS LUNCHEON

Presiding: Kay Rodriguez

Speaker: Dennis O'Leary, M.D.

Presentation of Awards:
John F. Sherman, Ph.D.

GROUP ON STUDENT AFFAIRS

November 2

FINANCIAL AID FORUM

Moderator: Cheryl Wilkes

New Institutional Perspectives in Student Financing
William I. Ihlanfeldt

The Private Capital Marketing Funding Perspective
James J. Unland

The Sallie Mae Perspective
Edward Fox

The Medical School Perspective
Edward J. Stemmler, M.D.

November 3

Business Meeting
Chairman: W. Albert Sullivan, Jr., M D.

November 4

THE GENERAL PROFESSIONAL EDUCATION OF THE PHYSICIAN—A STUDENT AFFAIRS PERSPECTIVE ON THE AAMC STUDY

Moderator: W. Albert Sullivan, Jr., M.D.

Faculty Participation Is Essential for Change
August G. Swanson, M.D.

Planning and Management of the Medical Education Experience
Fredric D. Burg, M.D.
George E. Ruff, M.D.

GSA/GROUP ON MEDICAL EDUCATION PROGRAM

RESEARCH IN MEDICAL EDUCATION TWENTIETH ANNUAL CONFERENCE

November 4

PRESENTATION OF SYMPOSIA

SELF-EVALUATION IN UNDERGRADUATE AND GRADUATE MEDICAL EDUCATION

Organizer: Louise Arnold, Ph.D.

Panelists: Rosalia E. A. Paiva, Ph.D.
T. Lee Willoughby
Christel A. Woodward, Ph.D.

INTERNAL EVALUATIONS OF CURRICULAR PROGRAMS: PROBLEMS, METHODS, AND RECOMMENDATIONS

Chairman: Fredric D. Burg, M.D.

Organizer: J. Gregory Carroll, Ph.D.

Panelists: J. Gregory Carroll, Ph.D.
William C. McGaghie, Ph.D.
Myra Ramos

DETERMINANTS OF PHYSICIAN IMPAIRMENT

Organizers: Carol Gilligan, Ph.D.
Carol Nadelson, M.D.
Malkah T. Notman, M.D.

Panelists: Carol Gilligan, Ph.D.
Carol Nadelson, M.D.
Malkah Notman, M.D.
Steven Shieber, M.D.
Diana M. Zuckerman, Ph.D.

NEW APPROACHES TO INSTRUCTION IN COST-EFFECTIVE CLINICAL DECISION-MAKING

Organizer: Arthur S. Elstein, Ph.D.

Panelists: Frank Hale, Ph.D.
Raymond J. Mayewski, M.D.
Marilyn L. Rothert, Ph.D.
Sankey V. Williams, M.D.

November 5

DEVELOPMENT OF A COURSE IN PREVENTION, FOCUSING ON CANCER

Organizer: Arlene R. Barro, Ph.D.

Panelists: William A. Anderson, Ph.D.
Richard Gallagher, Ph.D.
J. Dennis Hoban, Ed.D.
Ralph Ingersoll, Ph.D.
Jack J. Mason, Ph.D.
Robert E. Roush, Ed.D.
Frank Schimpfhauser, Ph.D.
Howard L. Stone, Ph.D.

ETHICAL CONDUCT OF STUDENT PHYSICIANS: THE SPECIAL PROBLEM OF CHEATING

Organizer: Fredericka Oakley

Panelists: John Sabini, Ph.D.
M. Roy Schwarz, M.D.
Frederick Sierles, M.D.
Maury Silver, Ph.D.
David J. Wolk

THE RISE AND FALL OF THREE-YEAR MEDICAL CURRICULA

Organizers: B. M. Ferrier
C. A. Woodward, Ph.D.

Panelists: John Baumber
Robert L. Beran, Ph.D.
Gerry R. Schermerhorn
Christel A. Woodward, Ph.D.

INTERPERSONAL SKILLS TRAINING FOR MEDICAL STUDENTS: EXAMINING THE STATE OF THE 'ART'

Chairman: Roland J. Weisser, Jr., M.D.

Organizer: Franklin J. Medio, Ph.D.

Panelists: Julian Bird, M.R.C.P., M.R.C.
J. Gregory Carroll, Ph.D.
Franklin J. Medio, Ph.D.
Franklin M. Putnam, M.D.
Paula L. Stillman, M.D.

IMPROVED CLINICAL EVALUATION IN UNDERGRADUATE MEDICAL EDUCATION

Organizer: David B. Swanson, Ph.D.
Panelists: Howard S. Barrows, M.D.
Charles P. Friedman, Ph.D.
Harold G. Levine
Geoffrey R. Norman, Ph.D.

November 4

PRESENTATION OF PAPERS
TEACHING CLINICAL SKILLS

Moderator: Paula L. Stillman, M.D.

A Psychometric Study of Measures of Medical Interviewing Skills
David B. Swanson, Ph.D., et al.

The Effects of Medical Information and Extent of Training on the Interviewing Skills of Medical Students
Mark L. Wolraich, M.D., et al.

Evaluating History-Taking and Physical Examination Skills: A Structured vs Traditional Approach
Debra A. DaRosa, et al.

Procedural Skills in Internal Medicine
Robert S. Wigton, M.D., et al.

CONTINUING MEDICAL EDUCATION

Moderator: Harold Levine

Accuracy of Physician's Self Reported Practice Profiles
Lynn Curry, Ph.D., et al.

Measuring Participant Learning and Change in Practice Behavior for Continuing Medical Education Programs
Ronald J. Markert, Ph.D., et al.

The Extent of Physician Participation in Continuing Medical Education Activities
Linda K. Gunzburger, Ph.D., et al.

STUDENT CHARACTERISTICS

Moderator: Frank T. Stritter, Ph.D.

A Comparative Study of Physicians from Two Decades
Sandra R. Wilson, Ph.D., et al.

Medical Students' Personality Changes from Freshmen to Seniors
Karen Kelley, M.D., et al.

The Income Expectations of Medical Students in the Time Period 1970 to 1980
Jon Veloski, et al.

EXAMINATIONS TECHNIQUES

Moderator: Barbara J. Andrew, Ph.D.

Cueing on Multiple Choice Items for Medical Students
Margaret E. Uguroglu, et al.

The 'Triple-Jump' Exercise—Further Studies of an Evaluative Technique
A. C. P. Powles, et al.

A New Examination for the Evaluation of Diagnostic Problem-Solving
Susan M. Case

CAREER CHOICE

Moderator: George Zimny, Ph.D.

Clinical Experiences: Do They Make a Difference on Specialty Choice Decision?
Nu Viet Vu, Ph.D., et al.

Personality Types of Family Practice Residents as Measured by the Myers-Briggs Type Indicator
Dona L. Harris, Ph.D., et al.

Longitudinal Changes in Specialty Preferences: Sex Differences

Larry D. Gruppen, et al.

STANDARD SETTING

Moderator: John S. Lloyd, Ph.D.

Assessing the Reliability and Validity of Educational Standards
Robert B. Parks, Ph.D.

External and Internal Tests of Preclinical Learning: Content Representativeness, Item Educational Emphasis, and Student Achievement
William C. McGaghie, et al.

Professional Competence Assurance Program (PROCAP): Physician Performance in the Ambulatory Care of 1229 Patients with Hypertension
David S. Gullion, M.D., et al.

November 5

NEW MCAT ANALYSIS

Moderator: Arthur I. Rothman, Ed.D.

The Overall Validity of the New MCAT
Jon Veloski, et al.

Predicting Medical School Performance Using the Old and New MCAT
Alan Hull, Ph.D., et al.

Using the New MCAT and NBME Subject Examinations to Predict Performance in a Medical School Behavioral Sciences Course
John M. Beaton, Ph.D., et al.

IMPACT OF PROGRAMS ON CLINICAL PERFORMANCE

Moderator: Edwin F. Rosinski, Ed.D.

Unraveling the Meaning of Global Comparative Ratings of Interns
C. A. Woodward, et al.

Long-Term Stability of Graduates' Rating of Their Educational Programs: Or—What is to be Gained by Post-Program Follow-Up Surveys?
J. Crook, et al.

A Comparative Survey of Former Residents' Professional Activities and Retrospective Ratings of Training Program Effectiveness
Richard B. Countiss

CURRICULUM EVALUATION

Moderator: Reed Williams, Ph.D.

Curriculum Evaluation: A Many Splendored Thing?
William Weston, III, M.D., et al.

Structuring Clinical Medical Education: A Problem Specific, Performance Based Framework
Emil R. Petrusa, Ph.D.

Goal Attainment Scaling in a Psychiatric Clerkship
Grant D. Miller, M.D., et al.

The Impact of Participation in a Primary Care Track Program on Medical Student Career Decision
Mike Mallea, M.D., et al.

ISSUES IN SELECTION

Moderator: C. Benjamin Meleca, Ph.D.

Applicant Characteristics, School Character, and the Admission Selection Process
Carl N. Edwards

Comparison of Perceived Stress Levels Among Medical and Law Students
Marilyn Heins, M.D., et al.

A Multicomponent Validity Study of House Staff Selection Process
Charles P. Friedman, Ph.D., et al.

INSTRUMENT VALIDATION

Moderator: Lawrence Tremonti, M.D.

The Validity of Simulated Patients
G. R. Norman, et al.

A Longitudinal Study of Observational Ratings by Clinical Faculty
John H. Littlefield, Ph.D., et al.

The Instructor Satisfaction Questionnaire: Its Development and Validation
Anne Roth, et al.

Minutes of AAMC Assembly Meeting

November 3, 1981

Washington Hilton Hotel, Washington, D. C.

Call to Order

Dr. Julius R. Krevans, AAMC Chairman, called the meeting to order at 8:15 a.m.

Quorum Call

The Chairman recognized the presence of a quorum.

Consideration of the Minutes

The minutes of the October 28, 1980, Assembly meeting were approved without change.

Report of the Chairman

Dr. Krevans reported to the Assembly on the activities of the Executive Council during the preceding year. He gave special attention to the Council's response to budgetary and legislative proposals, which resulted in the Association's setting as its priorities research and research training, student financial assistance, and support for the Medicaid and Medicare programs. He also mentioned several Association committees and their reports and discussed some of the policy issues on which the Council had acted during the past year.

Dr. Krevans extended a special thanks to the following individuals, whose terms on the Association's Administrative Boards had expired:

From the Council of Deans: Steven C. Beering, Allen W. Mathies.

From the Council of Academic Societies: Carmine D. Clemente, Brian A. Curtis.

From the Council of Teaching Hospitals: Dennis R. Barry, John W. Colloton, Robert K. Match.

From the Organization of Student Representatives: Lisa Capaldini, Wendy Crum, Susan Haack, Jo Linder, Manuel Marquez, Steven Phillips, Louis van de Beek.

Report of the President

Dr. John A. D. Cooper provided the Assembly with the latest information about the fiscal year 1982 budget and appropriations process, including OMB action to defer expenditures of funds in excess of the Administration's September budget. Dr. Cooper anticipated that pressure to reduce funding for programs of interest to medical centers would not abate.

The Association has been notified that the Pew Memorial Trust would support its proposal for Regional Institutes on Geriatrics and Medical Education. The steering committee for this new AAMC initiative would be chaired by Joseph E. Johnson, III, M.D., Chairman of Medicine at the Bowman Gray School of Medicine.

Another new Association project, a study of the General Professional Education of the Physician, had been funded by the Kaiser Family Foundation. The Advisory Panel for this project will be chaired by Steven Muller, President of Johns Hopkins University. William Gerberding, President of the University of Washington, Seattle, will serve as vice chairman. The advisory committee will have broad representation from university and medical school faculties and the medical profession.

Dr. Cooper discussed the Association's activities with respect to the competition issue. Although there did not appear to be sufficient consensus in Congress for enactment of any of the existing competition proposals, Dr. Cooper predicted that medical centers and teaching hospitals would nevertheless be subject to mounting competitive forces and that there would be increased regulatory approaches to containing costs.

Report of the Council of Deans

Dr. Steven C. Beering reported that the spring meeting of the Council of Deans had been devoted to "Crosscurrents of the Eighties." An additional feature of that program had been an orientation session for new deans. The Council had amended its rules and regulations to expand the size of its Administrative Board and to include as a member of the Board the Immediate Past Chairman of the Council. Dr. William Luginbuhl was named as new Chairman of the Council. Dr. Richard Janeway was named Chairman-Elect. New members of the Administrative Board were M. Roy Schwarz, D. Kay Clawson, Arnold L. Brown, and William B. Deal.

Report of the Council of Academic Societies

Dr. Daniel X. Freedman stated that the February interim meeting of the CAS had dealt with the proposed single route to licensure and external evaluation examinations. In March the Council had held an emergency meeting with representatives of the Reagan Administration to discuss budgetary matters. The CAS program at the Annual Meeting had included sessions on the appropriate college preparation for medical school, the role of basic scientists in clinical departments, the reinforcement of basic science education during clinical education, and the identification of basic science concepts for medical student learning.

Report of the Secretary-Treasurer

Mr. Stuart Marylander, in his report as Secretary-Treasurer of the Association, reviewed the activities of the Audit Committee and the Association's financial statement.

> ACTION: *On motion, seconded, and carried, the Assembly adopted the report of the Secretary-Treasurer.*

Report of the Council of Teaching Hospitals

Mr. Marylander reported that the Council of Teaching Hospitals' principal project throughout the year had been its study of the distinctive characteristics and related costs of teaching hospitals. Although the study had been delayed by problems in obtaining all of the required data, it was anticipated the study would be ready for publication early in the next year.

Report of the Organization of Student Representatives

Mr. Grady Hughes reported that the OSR had increased its efforts to affect Congress on student financial assistance issues. The OSR had also developed due process guidelines and had distributed an issue of the OSR Report on physician manpower. During the past year the OSR had also worked on a number of other projects, including a study of ethical issues at medical schools and a network for exchange of housing information. At the Annual Meeting the OSR had sponsored several discussion sessions and had passed a number of resolutions which would be transmitted to the Council of Deans. Ed Schwager was named Chairperson-Elect of the OSR.

Election of New Members

> ACTION: *On motion, seconded, and carried, the Assembly by unanimous ballot elected the following organizations, institutions, and individuals to the indicated classes of membership:*

Institutional Membership: East Carolina University School of Medicine; Marshall University School of Medicine; Texas A & M University College of Medicine; Ponce School of Medicine; University of South Carolina School of Medicine; Northeastern Ohio Universities College of Medicine.

Academic Society Membership: American Academy of Physical Medicine & Rehabilitation; American Society of Human Genetics; Child Neurology Society; Association of Directors of Medical Student Education in Psychiatry, Inc.

Teaching Hospital Membership: The Aultman Hospital Association, Canton, Ohio; The Carney Hospital, Boston, Massachusetts; Children's Hospital Medical Center, Akron, Ohio; Danbury Hospital, Danbury, Connecticut; Detroit Receiving Hospital and University Health Center, Detroit, Michigan; Frankford Hospital, Philadelphia, Pennsylvania; Froedtert Memorial Lutheran Hospital, Milwaukee, Wisconsin; Saint Joseph's Hospital, Milwaukee, Wisconsin; Saint Mary's Hospital, Grand Rapids, Michigan; Saint Mary of Nazareth Hospital, Chicago, Illinois; Tampa General Hospital, Tampa, Florida; University Hospital, Stony Brook, New York; Veterans Administration Medical Center, Des Moines, Iowa.

Corresponding Membership: Grant Hospital, Columbus, Ohio; Saint Elizabeth Medical Center, Dayton, Ohio; Veterans Administration Medical Center, Fresno, California; Veterans Administration Medical Center, Mountain Home, Tennessee.

Individual Membership: List attached to archive copy of these minutes.

Distinguished Service Membership: F. Marian Bishop, Robert Derzon, Sidney Lewine, Hiram Polk, Robert Van Citters, Irvin Wilmot.

Emeritus Membership: Lad Grapski, John Lattimer, Emanuel Papper.

Amendments to the Association Bylaws

ACTION: *On motion, seconded, and carried, the Assembly by unanimous ballot amended the Association bylaws to read as follows:*

Article I, Section 2B:

Distinguished Service Members shall be persons who have been actively involved in the affairs of the Association and who have made major contributions to the Association and its programs.

Article I, Section 3E:

Distinguished Service Members shall be recommended to the Executive Committee by either the Council of Deans, the Council of Academic Societies, or the Council of Teaching Hospitals. The Executive Committee shall present Distinguished Service Member nominations to the Executive Council.

Article VI, Section 2:

The Executive Council shall consist of nine members elected by the Assembly and ex officio the Chairman, Chairman-Elect and Immediate Past Chairman of the Assembly and each of the three Councils created by these bylaws, the President of the Association, and the Chairperson and Chairperson-Elect of the Organization of Student Representatives, all of whom shall be voting members. Of the nine members of the Executive Council elected by the Assembly, one shall be a member of the Council of Academic Societies, one shall be a member of the Council of Teaching Hospitals, six shall be members of the Council of Deans, and one shall be a Distinguished Service Member. The elected members of the Executive Council shall be elected by the Assembly at its annual meeting, each to serve for three years or until the election and installation of a successor. Each shall be eligible for re-election for one additional term of three years. Each shall be elected by majority vote and may be removed by a vote of two-thirds of the members of the Assembly present and voting.

Article VI, Section 7:

In the event of a vacancy on the Executive Council, either through resignation of an elected member or election of such a member to an ex officio seat on the Council, the remaining members of the Council may appoint a successor to complete the unexpired term. The Council is authorized at its own discretion to leave a vacancy unfilled until the next annual meeting of the Assembly. Members of the Executive Council are eligible for election to the Council for two full terms following completion of any partial term.

Report of the Resolutions Committee

There were no resolutions reported to the Resolutions Committee for timely consideration and referral to the Assembly.

Report of the Nominating Committee

Dr. John E. Jones, Chairman of the AAMC Nominating Committee, presented the report of that committee. The committee is charged by the bylaws with reporting to the Assembly one nominee for each officer and member of the Executive Council to be elected. The following slate of nominees was presented: AAMC Chairman-Elect: Steven C. Beering; Executive Council, COD representatives: John E. Chapman, M. Roy Schwarz; Executive Council, COTH representative: Mark S. Levitan; Executive Council, CAS representative: Frank C. Wilson, Jr.

ACTION: *On motion, seconded, and carried, the Assembly approved the report of the Nominating Committee and elected the individuals listed above to the offices indicated.*

Installation of New Officers

Dr. Thomas K. Oliver, Jr. was installed as the AAMC's new Chairman at the plenary session immediately following the Assembly meeting.

Adjournment

The Assembly adjourned at 9:10 a.m.

Annual Report

1980–81

Note: The President's Message appeared in the January issue of the *Journal of Medical Education.*

Executive Council, 1980-81

Julius R. Krevans, chairman
Thomas K. Oliver, Jr., chairman-elect
John A. D. Cooper, president

Council Representatives:

COUNCIL OF ACADEMIC SOCIETIES

David M. Brown
Carmine D. Clemente
Daniel X. Freedman
Virginia V. Weldon

DISTINGUISHED SERVICE MEMBER

Manson Meads

COUNCIL OF DEANS

Steven C. Beering
John E. Chapman
John W. Eckstein
Richard Janeway
William H. Luginbuhl
Allen W. Mathies, Jr.
Richard H. Moy
Leonard M. Napolitano
Edward J. Stemmler

COUNCIL OF TEACHING HOSPITALS

John W. Colloton
Stuart J. Marylander
Mitchell T. Rabkin
John Reinertsen

ORGANIZATION OF STUDENT REPRESENTATIVES

Lisa Capaldini
Grady Hughes

Administrative Boards of the Councils, 1980-81

COUNCIL OF ACADEMIC SOCIETIES

Daniel X. Freedman, chairman
David M. Brown, chairman-elect
Carmine D. Clemente
Brian A. Curtis
William F. Ganong
Lowell M. Greenbaum
Robert L. Hill
T. R. Johns, III
Joseph E. Johnson, III
John B. Lynch
Virginia V. Weldon
Frank C. Wilson

COUNCIL OF DEANS

Steven C. Beering, chairman
William H. Luginbuhl, chairman-elect
David R. Challoner
John E. Chapman
John W. Eckstein
Richard Janeway
Allen W. Mathies, Jr.
Richard H. Moy
Leonard M. Napolitano
Edward J. Stemmler

COUNCIL OF TEACHING HOSPITALS

Stuart J. Marylander, chairman
Mitchell T. Rabkin, chairman-elect
Dennis R. Barry
James W. Bartlett
John W. Colloton
Fred J. Cowell
Spencer Foreman
Robert E. Frank
Earl J. Frederick
Mark S. Levitan
Robert K. Match
Haynes Rice
John A. Reinertsen
John V. Sheehan

ORGANIZATION OF STUDENT REPRESENTATIVES

Lisa Capaldini, chairperson
Grady Hughes, chairperson-elect
Wendy Crum
Susan M. Haack
Jo Ellen Linder
Manuel Marquez
Dan Miller
Steven G. Phillips
Edward Schwager
Michael Tom
M. Louis van de Beek

The Councils

Executive Council

Between the Annual Meetings of the Association, the Executive Council meets quarterly to deliberate policy matters relating to medical education. Issues are brought to the Council's attention by member institutions or organizations and from the constituent Councils. Policy matters considered by the Executive Council are first referred to the Administrative Boards of the constituent Councils for discussion and recommendations before final action.

Agenda items at the traditional December retreat for the Association's officers and executive staff presaged many of the issues that would appear on the Executive Council's agenda through the year: price competition in the health care sector, proposed changes in the examination sequences of the National Board of Medical Examiners and the Federation of State Medical Boards, United States citizens studying medicine abroad, the final report of the Graduate Medical Education National Advisory Committee, and changes in national policy affecting medical schools and teaching hospitals. Retreat participants engaged in a lively discussion on activities at medical centers that could be characterized as a possible "commercialization" of the academic enterprise. Since it was felt that this important topic would benefit from more widespread discussion among the Association's constituency, it was agreed that the theme of the 1981 Annual Meeting would be "Tomorrow's Medicine: Art and Science or Commerce and Industry?" A new Association project for a three year study to review the general professional education of the physician was also discussed.

The 1980 Presidential and Congressional elections set the stage for a comprehensive review of national policies and priorities. Consequently, during the past year the Executive Council has devoted considerable attention to analyzing new budget proposals for their impact on medical center activities, in reviewing existing Association positions on national policy issues for their applicability and relevance to the new political structure, and in developing and formulating responses to new proposals from the Administration and Congress.

The Executive Council endorsed a strategy emphasizing that all programs important to medical centers should be supported and funded at levels equal to the 1980 Congressional appropriations plus adjustments for inflation. The priorities set by the Executive Council were research and research training, student financial aid, programs of the Veterans Administration, institutional support including financial distress grants, and special project grants. The Executive Council also expressed its opposition to the proposed cap on Medicaid expenditures and changes in the program that would increase the flexibility of states to reduce eligibility, scope of services or freedom of choice in selecting providers. It was decided that the Association would support health planning by state and local authorities, and would not include the renewal of P.L. 93-641, the National Health Planning and Resources Development Act, as a priority of the Association. Particular efforts were required to assure the continued integrity of the National Research Service Awards program. The long-established practice under which the federal government had provided an element of institutional support for NRSA trainees came under attack. After carefully considering the options, the Executive Council adopted as Association policy the formal endorsement of the overriding importance of federal support for the training of biomedical and behavioral scientists and the principle that institutional support and indirect costs reimbursement are essential components of training awards.

In other research related action, the Executive Council decided that although federal support for independent research and development in universities was desirable, such funding should not occur through the indirect cost mechanism. It was feared that further increases in the indirect cost pool would reduce funds available for direct research costs, cause dissension among faculty members, provide further stimulus for re-examination of rates of increase in indirect costs rates, and jeopardize the current BSRG dedicated program at NIH.

Two reports by other organizations were deemed sufficiently critical to the Association's constituents to warrant formal responses. The Executive Council was troubled by several recommendations in the final report of the Graduate Medical Education National Advisory Committee, particularly those relating to reductions in medical class size. In its response the Association said, "If the educational capacity of our medical schools is to be reduced, sufficient time must be permitted for planning and implementing the reduction. Changes in class size must take into account the diversity of the institutions, their sponsorship, their special missions, and their multiple sources of support." The Urban Institute, under contract with the Department of Health and Human Services, had examined the probable impact on undergraduate medical education of a reduction in federal subsidies, and concluded that loss of such support would not adversely impact medical education. An important corollary of this conclusion was that student loan funds must be readily available. The Association concurred with the need to ensure unlimited access to student loans, but also expressed concerns about the applicability of the report's findings for special populations of applicants and students.

Several items relating to graduate medical education appeared on the Executive Council's agenda. For five years the parent organizations of the Liaison Committee on Graduate Medical Education (now the Accreditation Council for Graduate Medical Education) had been working on revisions in the General Requirements Section of the Essentials of Accredited Residencies in Graduate Medical Education. Although there were still some concerns about the sections on evaluation and the eligibility of graduates of non-LCME accredited schools, the Executive Council joined the other four parent organizations in approving the General Essentials. The new essentials will place greater responsibility on the institutional sponsors of graduate medical education for the quality of their programs and should considerably strengthen the ability of the residency review committees and the ACGME to require that educational programs be provided adequate resources and supervision. The Council also developed a paper on due process for students and residents and one on changes in Medicare reimbursement policies on house staff moonlighting. Both papers were distributed to the AAMC constituency.

The Executive Council's continuing review of important medical education policy areas was augmented by the work of a number of committees. At the January meeting, Robert E. Tranquada, Chairman of the ad hoc Committee on Competition, presented that committee's report. The report was accepted by the Council, and served as the basis for a widely distributed Association monograph on "Price Competition in the Health Care Marketplace: Issues for Teaching Hospitals."

The ad hoc External Examinations Review Committee, under the chairmanship of Carmine D. Clemente, was charged with studying a number of existing and proposed examinations of medical knowledge, including the National Board of Medical Examiners tests and the Federation Licensing Examination of the Federation of State Medical Boards. The Committee's report, "External Examinations for the Evaluation of Medical Education Achievement and for Licensure," was adopted unanimously at the Council's June meeting. The report concluded that the NBME's prototype Comprehensive Qualifying Examination could not evaluate the skills and personal professional qualifications that faculty of LCME-accredited schools evaluate as students progress through their curriculum. The report recommended that the Federation be urged not to require the FLEX I examination for graduates of LCME-accredited schools. The Committee further recommended that the ACGME require graduates of non-LCME accredited schools to pass both a written examination equivalent to the Parts I and II exams of the NBME certification sequence and a practical hands-on examination to evaluate clinical skills and personal professional qualifications. Licensure for independent practice, after a period of graduate medical education, for graduates of LCME-accredited schools should continue to be based on either passing the National Board certification sequence or the FLEX examination. For graduates of non-LCME accredited schools, unrestricted licensure should be based on passing the FLEX examination. The Executive Committee has met with representatives of the Federation to discuss the report; discussions continue. Prior to adoption of this report, the Executive Council at its March meeting had asked the Association representatives to the National Board to express their opposition to a proposed cooperative agreement between the Board and the Federation for the development and implementation of the FLEX I-II examination sequence.

An ad hoc Committee on Foreign-Chartered Medical Schools and U.S. Nationals Studying Medicine Abroad, under the leadership of William H. Luginbuhl, deliberated about issues raised in a report by the General Accounting Office entitled, "Policies on U.S. Citizens Studying Medicine Abroad Need Review and Reappraisal." The committee specifically was concerned about those foreign-chartered medical schools that maintain offices in the United States to recruit U.S. citizens or to place them in U.S. hospitals for clinical experiences. The committee agreed with GAO findings that the schools to which most U.S. citizens have access do not provide a medical education comparable to that available in the United States. The committee concluded that the current eligibility standards for certification by the Educational Commission for Foreign Medical Graduates are inadequate and recommended that the ECFMG be urged to adopt the examination methods recommended by the Association's ad hoc External Examinations Review Committee. The Executive Council approved and adopted the report in June. This report, "Quality of Preparation for the Practice of Medicine in Certain Foreign-Chartered Medical Schools," has been forwarded to the ACGME for incorporation into its deliberations on the standards of eligibility for graduates of non-LCME accredited medical schools.

The Executive Council has encouraged staff to seek funding for a new Association project on geriatrics and medical education. As a part of this new initiative, Robert N. Butler, Director of the National Institute on Aging, was invited to speak at a joint meeting of the Administrative Boards in September.

The September meetings of the Administrative Boards and the Executive Council also featured a special day-long session entitled, "Strategies for the Future," at which members heard presentations by Robert J. Blendon, Senior Vice President, the Robert Wood Johnson Foundation; William B. Schwartz, Professor of Medicine, Tufts University School of Medicine; David R. Challoner, Dean, Saint Louis University School of Medicine; and Julius R. Krevans, Dean, University of California, San Francisco, School of Medicine, on issues facing medical schools and teaching hospitals and their faculties and students in the 1980s. Small group sessions expanded on these discussions and began to consider appropriate Association activities for helping constituents with these problems.

The Executive Council considered and recommended to the Assembly two changes in the Association bylaws. The first would slightly modify eligibility criteria for election to Distinguished Service Membership. The second would specify the composition of the Executive Council to include the immediate past chairman and the chairman-elect of each Council. Further, the size of the Executive Council would be expanded by one to include the immediate past chairman of the Assembly.

During the year the Executive Council continued to oversee the activities of the Group on Medical Education, the Group on Student Affairs, the Group on Public Affairs, the Group on Business Affairs, and the Group on Institutional Planning.

The Executive Council, along with the Secretary-Treasurer, Executive Committee and the Audit Committee, exercised careful scrutiny over the Association's fiscal affairs, and approved a modest expansion in the general funds budget for fiscal year 1982.

The Executive Committee met prior to each Executive Council meeting and conducted business by conference call as necessary. The

Executive Committee met twice with the Association of Academic Health Centers' executive committee to facilitate coordination and communication between the organizations. The Executive Council also met with Department of Health and Human Services Secretary Richard S. Schweiker and Chairman Henry A. Waxman of the House Subcommittee on Health and the Environment to discuss issues of concern to the academic medical community.

Council of Deans

The Council of Deans held two major meetings during the 1980-81 year including the business meeting conducted at the Association's Annual Meeting in Washington, D.C. and a spring meeting in Colorado Springs, Colorado. In addition, the COD Administrative Board met quarterly to review Executive Council agenda items of significant interest to the deans and to carry on the business of the COD. More specific concerns were addressed by smaller groups of deans brought together by common interests.

Preceding the annual business meeting, Dr. Cornelius J. Pings, Director of the National Commission on Research and Vice Provost and Dean of Graduate Studies at the California Institute of Technology, addressed the Council on the relationship between academic research and the federal government. He highlighted a number of the key recommendations appearing in the Commission's reports. The primary discussions at the business meeting focused on an analysis of the various health manpower proposals and the recent efforts to amend the statutory authority of the National Institutes of Health. Progress reports were presented by the Committee on the Identification of the Unique Characteristics of the Teaching Hospital and the Committee on Competition. In addition, the Council adopted a statement opposing the action of the Board of Regents of the University of the State of New York in its decision to accredit certain foreign medical schools.

Eighty-nine deans attended the March 29-April 1 spring meeting devoted to "Academic Medicine—Crosscurrents of the Eighties." Robert M. Heyssel, Executive Vice-President and Director of The Johns Hopkins Hospital, and Emmett H. Heitler, former chairman of the Board of the Samsonite Corporation, discussed the academic medical center and the competitive environment. Arnold S. Kelman, Editor of the *New England Journal of Medicine*, elaborated on his concerns about the commercialism of medicine. A perspective on the Government Accounting Office report on U.S. foreign medical students was provided by William B. Deal, Dean of the University of Florida College of Medicine. The relationship of medicine to the university was addressed by William H. Danforth, Chancellor of Washington University, and Donald Kennedy, President of Stanford University. Edward N. Brandt, Jr., Assistant Secretary for Health, Department of Health and Human Services, presented a Washington perspective on medicine in the 1980s. The presentations stimulated much discussion among the deans regarding academic medicine in the next decade.

The spring meeting was preceded by an orientation session for new deans in which they were introduced to the staff, resources and programs of the AAMC. Several COD Board members gave personal insights to the new deans "on being a dean." The business meeting included an extended discussion of the Administration's recent budget proposals and national legislation affecting biomedical research, medical education and health services.

Additional agenda items included consideration of the Federation of State Medical Board's proposed "single route to licensure"; a report on the deliberation of an AAMC committee on foreign medical schools; the report from the AAMC ad hoc Committee on Competition; processes and procedures for academic and disciplinary decision-making related to students and house officers; and a progress report on the study of the unique characteristics of the teaching hospital.

Several items considered by the COD Administrative Board during its quarterly meetings deserve special note: the modification of the Health Care Financing Administration policy on resident moonlighting and the formulation of the AAMC response to the GMENAC Report. In addition, the Board approved a change in the COD Administrative Board.

Sections of the Council meeting during the year were the Southern deans, the Midwest deans, deans of private freestanding schools, and the deans of the new and developing community based medical schools.

Council of Academic Societies

In its 13 year history, the Council of Academic Societies has not been more active or played a more important role in AAMC activities than in 1980–81. Membership in CAS now totals 71 academic societies representing over 100,000 U.S. medical school faculty members from almost every basic and clinical science discipline.

Three major meetings dominated the activities of CAS during the last year. At the 1980 fall meeting, the CAS sponsored small group discussions on four timely issues: development of faculty leaders for research careers, competitive marketing of medical services, increasing interspecialty cooperation in graduate medical education, and the changes in faculty responsibilities in accounting for research activities. In addition, Jules Hirsch, Professor and Senior Physician, Department of Human Behavior and Metabolism, Rockefeller University, addressed the Council on the status of clinical investigation and the decline of medical student interest in research. Also in conjunction with the fall meeting, a CAS "Forum on Faculty" was held; AAMC staff members presented data on the changing characteristics of faculty and of factors influencing the choice of academic careers, and Jeremiah A. Barondess, Clinical Professor of Medicine at Cornell University, discussed the role of volunteer clinical faculty.

The February CAS Interim Meeting focused almost entirely on proposed changes in the National Board of Medical Examiners sequence and the single route to licensure (FLEX I-II) advocated by the Federation of State Medical Boards. Presentations were made by officers of the Federation and the National Board regarding the proposed changes with special attention to the development by the NBME of the Comprehensive Qualifying Examination (CQE) for use as FLEX I. In small discussion groups the Council examined a 330-question sample from the CQE Prototype. The following day leaders from each group reported on their respective group's discussion and it was during the course of these reports that the Council reached a consensus opposing implementation of a single route to licensure. Members of the Association's ad hoc External Examinations Review Committee were present at the meeting and many of the concerns expressed were subsequently incorporated into that committee's final report.

In addition to the regular fall and interim meetings, the CAS held its first public affairs meeting. Public Affairs Representatives from 47 of the 71 member societies convened to discuss the Reagan Administration budget proposals. Presentations were made by Robert J. Rubin, Special Assistant to the Secretary, Department of Health and Human Services; Herbert Pardes, Director, National Institute of Mental Health; Robert Graham, Acting Administrator, Health Resources Administration; Donald S. Fredrickson, Director, National Institutes of Health; and William J. Jacoby, Chief Medical Director, Veterans Administration. AAMC President John A. D. Cooper discussed the possible impact of the budget proposals on medical schools and teaching hospitals and their faculties.

The CAS Administrative Board conducted the business that arose throughout the year during quarterly meetings held before each Executive Council meeting. Preceding its meetings, the Board had informal discussions with Stephen A. Grossman, Majority Counsel, Senate Committee on Labor and Human Resources; Sheila P. Burke, professional staff member, Senate Finance Committee; and George A. Keyworth, Director, White House Office of Science and Technology Policy.

The quarterly *CAS Brief* continued to inform medical school faculty about current policy issues. The Association also continued its CAS Services Program for societies desiring special legislative tracking and office management services. Five societies participated in the program in 1980–81: American Federation for Clinical Research, Association of Professors of Medicine, American Neurological Association, American Academy of Neurology, and Association of University Professors of Neurology.

Council of Teaching Hospitals

The Council of Teaching Hospitals held two general membership meetings during 1980–81. The theme for the COTH General Session at the fall annual meeting was "The High Cost Patient: Implications for Public Policy and Teaching Hospitals." Featured speaker Marc J. Roberts, Professor of Political Economy and Health Policy at the Harvard School of Public Health, emphasized that resource limitations and the pressures for cost containment would force society to make difficult social choices regarding the allocation of health benefits. He believed that the greatest impact would be on the high cost patient. He recommended that teaching hospital executives consider strategies to maintain the hospital's place in the health care market, develop an internal plan to make choices and implement them with consensus, centralize resource allocation, reassess health planning, develop systematic data on the cost-benefit production function of health care, and address the consequences of devoting resources to different classes of patients.

Frank Moody, Chairman of Surgery at the University of Utah College of Medicine, and Irvin Wilmot, Executive Vice President, New York University Medical Center, were respondents to Dr. Roberts' remarks.

On May 6–8, 1981, COTH's fourth spring meeting was held in Atlanta, Georgia. In his keynote speech on "Health Care and The American Economy in the Eighties," Ralph S. Saul, Chairman and Chief Executive Officer of INA Corporation, asserted that the principal task for both health care providers and consumers would be "to make do with less." He emphasized that funds for health care are a finite resource and improved management would be needed to get more for the dollars expended.

Dennis S. O'Leary, Dean for Clinical Affairs at George Washington University Medical Center, recounted the hospital's experiences in the aftermath of the attempt to assassinate President Reagan. Dorothy P. Rice, Director of the National Center for Health Statistics, presented detailed tables and charts on "Morbidity, Mortality and Population Trends in the United States," describing the dramatic increase in the percentage of the elderly in the total U.S. population. The implications of the trends described by Ms. Rice were discussed by J. Alexander McMahon, President of the American Hospital Association, speaking on "The Implications for Traditional and Emerging Services"; Saul J. Farber, Acting Dean of the New York University School of Medicine, on "The Implications for Educational and Research Objectives"; and Loretta Ford, Dean of the School of Nursing at the University of Rochester, on "The Implications for the Spectrum of Nursing Services." William C. Richardson, Associate Dean at the School of Public Health at the University of Washington, spoke on "Physician Performance in Prepaid Medical Plans."

Individual workshops enabled small groups to discuss consumer choice and competition and their potential effects on teaching hospitals. In another session Veterans Administration medical center directors met with representatives of the VA's Chief Medical Director.

Representative Barber B. Conable, ranking minority member of the House Ways and Means Committee, spoke on "Social Security, Medicare, and Medicaid: Likely Developments in the Eighties." J. Ira Harris, general partner of Salomon Brothers, spoke on "Acquiring Capital in the Eighties," warning that drastic changes in capital financing would have to be met by major changes in hospital management philosophy. Speaker Henry E. Simmons, a principal with the accounting/management consulting firm of Peat, Marwick, Mitchell and Company, in an address on "American Industry: The New Tough Buyer of Health Care," declared that "competition is the future" and "the traditional hospital setting is dead." He further predicted that, as major buyers of health care, government and big business will seek new systems of health care.

The meeting's last session presented a report on the status of the COTH study on diagnostic case mix and other distinctive features of teaching hospitals. Mark S. Levitan, Executive Director of the Hospital of the University of Pennsylvania and Chairman of the AAMC ad hoc Committee on the Distinctive Characteristics and Related Costs of Teaching Hospitals, provided an overview, describing some of the problems that had been experienced with the data and their collection, and presenting preliminary statistics that had been compiled.

The COTH Administrative Board met five times to conduct the Council's business and to review and discuss Executive Council agenda items. Throughout the year the Administrative Board examined the various "pro-competition" proposals that have been introduced, their potential impact on teaching hospitals, and alternatives for addressing the issues. In other deliberations, the Administrative Board focused on several topics: the report of the Association's ad hoc Committee on Competition, interaction with the Commission on Professional and Hospital Activities, the revised General Requirements Section of the Essentials of Accredited Residencies in Graduate Medical Education, Medicare's reimbursement policy on resident moonlighting, the Association's project to describe and quantify the case mix and service characteristics of teaching hospitals, and the potential impact on teaching hospitals of various Medicare and Medicaid proposals contained in the budget reconciliation legislation under consideration by the Congress.

Preceding four of its meetings, the Administrative Board held informal discussions with various governmental officials and allied health organization executives. Howard Newman, Administrator of the Health Care Financing Administration, discussed the agency's objectives under the Carter Administration. Gail Warden, Executive Vice President of the American Hospital Association, and Howard Berman, AHA Group Vice President, spoke on the future of the Commission on Professional and Hospital Activities and other health care topics of mutual interest. Shiela P. Burke, professional staff member of the Senate Finance Committee, reviewed the budget reconciliation process and the various Medicare and Medicaid spending reduction proposals. Carolyne Davis, Administrator of HCFA, discussed that agency's activities under the Reagan Administration.

Organization of Student Representatives

During the past year five medical schools that had previously not participated in OSR chose to designate a representative, for a total of 117 schools active in the Organization. Ninety-four sent students to the annual meeting during which OSR sponsored discussion sessions on curricular reform vis-a-vis the "new biology," the National Resident Matching Program, sociobiology, lessons for U.S. health care from other countries, and other topics of special interest to students. This year students also attended the Women in Medicine general session. During its business meeting, the OSR passed 17 resolutions on issues such as improved teaching of cost effectiveness of medical procedures, the unique needs of the elderly, languages of local patients, basic clinical procedures, and the ethical responsibilities of physicians. Students also called for teaching methods that encourage development of problem-solving and life-long learning skills, for departments to provide faculty with opportunities to improve their teaching skills and to give greater weight to teaching ability in the evaluation of faculty, for improved counseling of premedical students about the diversity of approaches to preparing for a medical career, and for national examinations to be criterion rather than norm referenced-based in the determination of who passes or fails.

The Administrative Board met before each Executive Council meeting to coordinate OSR activities and to formulate recommendations on matters under consideration by the Council. Of these, the OSR Board gave the greatest attention to development of AAMC's response to the GMENAC report, due process for house staff, moonlighting by residents, problems related to U.S. students studying medicine abroad, and the deliberations of the ad hoc External Examinations Review Committee. The Board nominated students to serve on AAMC committees and made its nominations for student participation on the LCME. The Board also discussed ways in which the Consortium of Medical Student Groups can more effectively meet its information-sharing and legislation-influencing goals. One project begun by the Board was the design of a survey to obtain information from medical school deans, faculty and students on what schools are doing to foster in students an awareness of their ethical responsibilities as physicians-in-training and as practitioners; this project will include an examination of the problem of unethical behavior during training.

During the winter the result of OSR's work on due process guidelines for medical students was mailed to student affairs deans, GME cor-respondents and OSR members; this mailing included an analysis of the policies regarding student grievances currently being used by schools and a set of model guidelines for adaptation by schools should they wish to modify theirs. One issue of *OSR Report* titled "Facing the Challenges of the Physician Manpower Scenario" was mailed to all U.S. medical students; this issue offered an overview of federal support for medical education, physician manpower studies, programs designed to improve distribution, and the implications of the presently available information for medical students as they develop their career plans.

National Policy

During the past year, national policy has focused virtually exclusively on the issue of federal expenditures and revenues. Single-minded concern with domestic fiscal policy dominated the final actions of the now defunct 96th Congress as well as those of the fledgling 97th Congress. In broad strokes, the behavior of the legislative and executive branches of government in the early 1980s was characterized by growing support for retrenchments in federal spending on domestic initiatives.

Last fall the 96th Congress was understandably preoccupied with the November elections; consequently much of its work was delayed until the outcome of that contest was assured. The new Administration headed by President Ronald Reagan was deeply dedicated to a conservative philosophy regarding the scope and role of the federal government. The guiding force behind the policies of the new Administration was predicated on reductions in government spending and taxation, elimination of unnecessary or reformation of overly burdensome regulations, and encouragement of a consistent monetary policy.

Traditional processes for appropriations and continuing budget resolutions, as well as a relatively untested one called reconciliation, became the focus for Congressional, and thus the Association's, concern as devices for responding to vocal and mounting public concern about the prevalence of double-digit inflation. But ultimately, it was the new President's ability to persuade Congress to accept his economic program that produced sweeping transformations in federal spending and taxation policy.

On the appropriations front the increasingly common practice of funding health programs through a continuing resolution did not present any real difficulties until 1980 when three separate resolutions were required. The First Continuing Resolution provided FY 1981 funding only until December 15, 1980, for health research, education and service delivery programs at the lower of their present level or the House adopted level. The Second Continuing Resolution also stopped short of providing funding authority for the remainder of the fiscal year. The conferees set June 5, 1981, as the expiration date of the resolution because that was believed to be the approximate point at which federal spending would exceed the agreed upon ceiling.

Concerns about FY 1981 spending were exacerbated when President Carter submitted to the Congress his FY 1982 budget, which included substantial rescission requests for the fiscal year in progress. Moreover, the Reagan Administration lost no time in embellishing upon the previous submission, in most instances recommending much lower FY 1982 appropriations for domestic initiatives, and more severe FY 1981 rescissions for programs of paramount concern to the Association's constituents. Biomedical and behavioral research and research training, student assistance, institutional support and veterans medical programs were especially hard hit by the new rescission requests.

Rescission legislation, a bill that proposed cancellation, in whole or in part, of budget authority previously granted by Congress, together with consideration of a Third Concurrent Budget Resolution for FY 1981 and a First Concurrent Budget Resolution for FY 1982 proceeded on virtually identical schedules.

The Association, concerned with the immediate impact of the proposed rescissions, testified against these retrenchments before both Senate and House appropriations subcommittees as well as before committees concerned with veterans programs; testimony highlighted the potentially devastating impact the Administration's proposals would have on research, research training, medical education and VA health care and research. By June, the House and Senate concurred on a Third Continuing Resolution for FY 1981 that contained $14.3

billion in rescissions. The agreement embodied provisions which eliminated support for capitation, put a severe crimp in research and training programs administered by the Alcohol, Drug Abuse and Mental Health Administration, reduced by a small margin support for the NIH and for student assistance, but did not impair VA health care programs.

Against the backdrop of the FY 1981 rescissions controversy, the Congress was also considering the FY 1982 budget. The 1974 Budget and Impoundment Control Act established the procedures and a timetable for Congressional actions related to overseeing and controlling federal expenditures and revenues. The new Administration proved to be exceptionally adroit in employing the authorities embodied in this largely untested statute to achieve fiscal retrenchments.

Last year, in acting on the First Concurrent Resolution on the budget for FY 1981, the Congress broke tradition and agreed to carry out reconciliation in conjunction with the spending targets described in that legislation rather than postponing it until the binding Second Concurrent Resolution was enacted late in the budget process. Despite an initial display of enthusiasm, the Congress failed to effectively combine reconciliation with the First Concurrent Budget Resolution.

In the new Congress the House and Senate set to work with determination to fashion budget resolutions for FY 1982 and what remained of FY 1981.

The Senate majority was fully in accord with the President's final proposals and took the lead on budget issues, explicitly acknowledging that its bills "represented a dramatic change in government spending policies."

The House adopted similar targets in May in what proved to be the first in a series of budget battles in which the Administration would emerge victorious. Initially the House majority sought to counter the President's spending policies and thus, championed a bill that was more sparing of domestic programs than that enacted by the Senate. However, a solid House minority joined ranks with a small group of southern Democrats to defeat the more liberal measure and to enact in its stead the proposal championed by the Administration. This controversy marked the first appearance of the coalition of conservative southern Democrats that would consistently support the Administration. The Congress then began to implement the reconciliation instructions contained in the newly agreed upon First Budget Resolution. The reconciliation instructions called upon virtually all committees to revamp the programs under their purview to achieve specified levels of savings. The discretionary and entitlement health programs of paramount concern to medical centers were endangered as a consequence of the zeal of the Congress to abruptly curtail federal spending.

The work on reconciliation proceeded less smoothly in the House than in the Senate. In the House Committee on Energy and Commerce, the parent committee for most health programs, partisan disputes deadlocked approval of action by both Subcommittee and full Committee, and two versions of the required reconciliation legislation emerged. One, embodying Chairman John Dingell's proposals, was endorsed by the AAMC; the other strongly reflected OMB influence. When the Committee failed to reach accord on either version, the choice was deferred to the full House membership. On the House floor a bitter partisan battle was waged over reconciliation legislation with the ultimate adoption of an alternative and more austere reconciliation bill backed by the Administration. However, the final package included the more generous health provisions that the Association had endorsed.

Conferencing the House and Senate reconciliation bills proved to be especially difficult in the area of health, but on balance, the agreement that emerged preserved support for the programs of central interest to the AAMC's constituents. The final reconciliation package approved by the Congress went beyond strictly budgetary matters, and functioned as a vehicle for reauthorizing the health manpower and research training legislation that had been mired in a seemingly irresolvable Committee deadlock. Moreover, entitlement programs such as Guaranteed Student Loans and Medicare and Medicaid were affected by the reconciliation efforts and emerged visibly, and perhaps permanently, altered.

Health manpower proposals had been approved by both chambers during the 96th Congress, but House and Senate conferees were never able to reconcile their divergent views to produce a consensus bill.

In the 97th Congress manpower programs came under early attack via rescission requests. Specifically, the new Administration requested the abolition of the capitation and the Health Professions Student Loan programs, and abridgements of Family Medicine Training and General Medicine and Pediatrics programs. With the exception of capitation, the Congress ultimately approved rescissions much less severe than those advanced by the Administration.

Reauthorization of the manpower programs surfaced on the Congressional agenda early in the year. The Association testified on both sides of the Hill, stressing that federal participation in the medical education enterprise represents an appropriate and important utilization of federal resources.

The Senate Labor and Human Resources Committee reported manpower legislation in early May (S.799). The bill called for significant alterations in and dissolution of a number of manpower programs, and advanced spartan authorization ceilings for the remaining activities. The most troublesome aspect of S.799 was its very limited provisions for student assistance.

In the House, renewal of health manpower programs became entrained with, and ultimately resolved through, the reconciliation process. Although manpower legislation had been introduced and hearings convened, the responsible subcommittee had failed to formally report a bill. As Congress became embroiled in the process of slashing programs in accordance with reconciliation directives, it was decided to reauthorize the manpower program through that process, and the bill developed by Subcommittee Chairman Henry A. Waxman was incorporated into the reconciliation bill enacted by the House in late June.

Resolution of the divergent health manpower provisions of the two chambers proved difficult because the Senate approach to program reductions involved capping appropriations levels while the House measure, which prevailed, urged the conferees to reauthorize the manpower statute through the reconciliation process at the higher funding levels.

Much like the health manpower programs, the National Research Service Award program of NIH and ADAMHA came under sharp attack by the new Administration. A rescission proposal entailed eliminating institutional allowances and indirect cost reimbursement, both vital components of the programs, and reducing the number of trainees by 788 to a total of 10,000 for the NIH. The Association's testimony strongly defended the importance of the biomedical research training enterprise and emphasized the essentiality of institutional support and indirect costs to the quality of that endeavor. Both HHS Appropriations Subcommittees proved to be strong advocates of biomedical research training. The approved reductions in the research training amounted to less than 20 percent of the Administration's original proposals and the provision for institutional support and indirect costs was strongly endorsed in the reports accompanying the bills.

Unlike most of the programs operated under the auspices of the NIH, the NRSA program requires periodic reauthorization and legislative action was needed before September 30, 1981. Along with NRSAs, the committees also included considerations of Medical Library Assistance and the National Centers for Health Statistics, Health Care Technology, and Health Services Research, dubbing the measure an "omnibus health" bill.

During the Senate's hearings, the Association emphasized the importance of reversing the decline in the number of physicians entering research training and stabilizing federal support for biomedical research training. The important contributions that reimbursements for indirect cost and institutional allowances make to sustain the high quality of biomedical research training programs were also highlighted. The Association also objected to provisions in the Senate bill that compromised three medical library assistance grant programs and the National Centers. The Labor and Human Resources Committee never reported a bill, as the measure became deadlocked in Committee.

In early June the House convened a markup for its omnibus health bill. The House markup also deadlocked. At that point a decision was reached to try to include the bill in the House's reconciliation package.

In lieu of incorporating the Senate omnibus health bill in that chamber's reconciliation legislation, Senate Committee Chairman Orrin Hatch inserted both authorization ceilings for NRSAs and an overall cap on NIH appropriations, together with an explicit assumption that an omnibus health bill would be enacted later in the year. Again, Senate and House proposals were deeply divergent. In the reconciliation conference, the issue was resolved quite rapidly with the conferees agreeing to reauthorize the National Research Service Award program for two years at amounts closer to the higher House-passed figure, and to retain the current statutory provision mandating institutional support components for the awards.

While the outcome was, in general, better than might have been expected, future amounts of research training support are sure to be somewhat less than currently provided. Report language accompanying the conference bill clearly states that the final balance between numbers of trainees and levels of institutional support is to be determined by HHS under the general guideline that the number of trainees be near that currently supported and that the level of institutional support be close to that now provided. In addition, all current authorities for medical library assistance were retained and all three of the National Centers were reauthorized for three years.

Assistance programs for post-secondary school students also fell victim to the reconciliation retrenchments despite the fact that legislation renewing and revising these programs had been enacted only a few months earlier.

Of particular concern was the reauthorization of the Guaranteed Student Loan program, the major source of assistance to medical students, in the 1980 Higher Education Act renewal. The 1980 statute raised the interest rate for loans to new borrowers under this program to nine percent from the prevailing level of seven percent. In addition it increased the total borrowing limit for undergraduate and graduate education, granted discretionary authority to increase the borrowing limit applicable to graduate and professional students pursuing programs deemed "exceptionally expensive," permitted deferral of repayment for a two-year period for borrowers serving internships required for professional practice, and decreased the prevailing 9–12 month grace period before repayment to 6 months. Finally, the law contained a particularly desirable provision permitting the consolidation of certain loans, unfortunately specifically nullified by later legislation; had it not been repealed, it would have proved extremely beneficial for medical students with the higher interest rate HEAL loans.

Reducing the cost of the GSL program emerged early as a priority of the new Administration, and Congress sought to reduce the scope of the program through the reconciliation process. The final accord reached on the GSL program was somewhat more generous than that initially advanced by either the House or the Senate. It limited eligibility to students with adjusted gross family incomes of $30,000 or less and, for higher income families, to applicants able to document need. The conferees also agreed to require all students to pay a 5 percent origination fee upon receipt of their loans. The final version retains all periods of deferral now embodied in current law, including the two-year deferral for "internships."

The final version of the reconciliation bill addressed five Medicare items of particular interest to AAMC members. Positions advocated by teaching hospitals were adopted on two issues. Conferees agreed to omit the proposal requiring that interest earned on funded depreciation be offset against interest paid on capital indebtedness, and to modify the prospective renal dialysis rate. On two other issues conferees reached an accord on provisions which imposed a significant payment reduction on hospital services by requiring that the general inpatient routine service cost limits be set at no more than 108 percent of the group mean (presently 112 percent), and that a new payment limitation on the costs of hospital and clinic-based out-patient visits, excluding emergency room visits, be established based on charges of physicians for comparable office visits. Both of these payment limitations will have particularly adverse impacts on teaching hospitals. Finally, conferees agreed to reduce the present 8.5 percent Medicare nursing differential to 5 percent.

In terms of the Medicaid program, despite considerable pressure by the Administration, the conferees rejected all proposed versions of a cap, instead reaching consensus to reduce the projected federal payment for the Medicaid program by 3 percent in FY 1982, 4 percent in FY 1983, and 4.5 percent in FY 1984.

Action on a number of other national policy issues of concern to the Association's constituents occurred outside the reconciliation process. Legislation to reorganize the National Institutes of Health and to revamp the funding mechanism for biomedical research occupied much of the time and energy of AAMC staff during the 96th Congress. Although both chambers passed bills by overwhelming margins, the conferees were unable to reach agreement on a consensus measure. Particularly troublesome were proposals embodied in both measures that would have established authorization ceilings and short-term authorities for each of the institutes. Several items initially incorporated into the biomedical research bills were enacted. The final legislation contained a series of miscellaneous provisions that reauthorized the National Cancer Institute and the National Heart, Lung and Blood Institute until the end of fiscal year 1982, renamed the National Institute of Arthritis, Metabolism and Digestive Diseases as the National Institute of Arthritis, Diabetes and Digestive and Kidney Disease, provided for training stipends from Diabetes Research and Training Centers and Multipurpose Arthritis Centers funds, established a Digestive Diseases Advisory Board, and required HHS to contract with the Institute of Medicine for a review of previous and ongoing neurological research and to outline a five-year plan for further research. Although specific biomedical research legislation has not yet emerged in the 97th Congress, Senator Hatch recently proposed to place an authorization ceiling on the NIH appropriations. The rationale for the proposal was to assure that FY 1982 spending levels for the NIH did not exceed the Administration's recommendations. Some observers view the proposal as a prelude to the resumption of consideration of legislation similar to that proposed in the last Congress.

The Congress voted overwhelmingly on August 27, 1980, to override President Carter's veto of legislation to revise and make permanent the authority of the Veterans Administration to enter into special pay agreements with physicians and other health professionals employed by the VA's Department of Medicine and Surgery. This law considerably improved the current situation by providing substantial increases in bonus pay and more favorable retirement benefits. Despite early assurances by the new Administration that the budget of the Veterans Administration would not be subject to funding reductions, the Reagan budget recommended large cuts in important VA programs including those authorized by this law. The Association registered its protest to these proposals in appearances before the relevant Appropriations Subcommittee as well as a special House Budget Subcommittee. In the final analysis, the Congress largely ignored the Administration's recommendation and provided the funds necessary to implement the physician pay bonuses and denied virtually all the rescission requests directed at VA medical care programs.

Measures requiring that 10 to 15 percent of the research and development budgets of federal R&D agencies be spent with small business firms were introduced in the 96th Congress and, in more modest (1 percent set-aside) forms, into the 97th; one, in particular, has received wide support. The proposal, advanced in identical Senate and House bills, most disturbing to the Association, mandates that one percent of the R&D budget of major research agencies be sequestered for grant and contract awards to small businesses. Essentially, the legislation would circumvent the traditional policy of awarding funds on the basis of the technical merit of the work proposed and competence of the performer.

Despite the fact that the various bills designed to promote "humane" research methods were not subject to action in the 96th Congress, similar measures have been reintroduced this year. The issues at stake involve fund set-aside for developing research and testing methods alternative to those involving live animals, mandatory adoption of alternative methods of demonstrated validity, and prohibition on the use of federal funds for "duplicative" research involving live animals.

The Department of Health and Human Services and the Food and Drug Administration published separate sets of regulations governing the activities of Institutional Review Boards and the protection of human research subjects in January 1981. The final rules, while not completely satisfactory from the Association's perspective, represent a substantial improvement over the proposed regulations issued in August 1979. Of particular concern in these proposals were inconsistencies between the two policies, the imposition of scientific review functions on IRBs and the establishment of burdensome paperwork requirements. Generally, the Association was satisfied with the HHS proposal, but encountered serious problems with the FDA proposition. A review of the final rules indicates that many of these problems were eliminated or at least mitigated, although troubling disparities remain in the areas of assurances, inspections, sanctions and confidentiality.

Working with Other Organizations

Last year the five parent organizations of the Coordinating Council on Medical Education — the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Council of Medical Specialty Societies, and the AAMC — agreed to reorganize the CCME. In 1981 the new Council for Medical Affairs met for the first time. Unlike the CCME, the CFMA does not have a coordinating role over accreditation activities, but it does provide an opportunity for these similar but diverse associations to discuss issues affecting medical education. With each parent organization naming its top two elected officers and its chief executive officer as its representatives, the CFMA has become a valuable forum for the exchange of ideas and opinions, and has fostered cooperative activity in several important areas.

Since 1942 the Liaison Committee on Medical Education has served as the national accrediting agency for all programs in medical education leading to the M.D. degree. The LCME is sponsored by the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. Prior to 1942, and beginning in the late nineteenth century, medical schools were reviewed and approved separately by the AAMC and the AMA. The LCME is recognized by the physician licensure boards of the 50 states and U.S. territories, the Canadian provinces, the Council on Postsecondary Accreditation and the Department of Education.

The accrediting process assists schools of medicine to attain prevailing standards of education and provides assurance to society and the medical profession that graduates of accredited schools meet reasonable and appropriate national standards; to students that they will receive a useful and valid educational experience; and to institutions that their efforts and expenditures are suitably allocated. Survey teams provide a periodic external review, identify areas requiring increased attention, and indicate areas of strength as well as weakness. The findings of the LCME have been used to establish national minimal standards by universities, various government agencies, professional societies, and other organizations having working relationships with physicians.

The LCME, through the efforts of its professional staff members, provides factual information, advice, and both informal and formal consultation visits to newly developing schools at all stages from initial planning to actual operation. Since 1960 forty-one new medical schools in the United States and four in Canada have been accredited by the LCME.

In 1981 there are 126 accredited medical schools in the United States, of which one has a two-year program in the basic medical sciences and four have not yet graduated their first classes and consequently are provisionally accredited. The 122 schools that have graduated students are fully accredited. Additional medical schools are in various stages of planning and organization. The list of accredited schools is found in the *AAMC Directory of American Medical Education*.

A number of new medical schools have been established, or proposed for development, in Mexico and various developing island countries in the Caribbean area. These entrepreneurial schools seem to share a common purpose, namely to recruit U.S. citizens. There is grave concern that these are educational programs of questionable quality based on quite sparse resources. While the LCME has no jurisdiction outside the United States and its territories, the staff has attempted to collect information about these new schools and to make such data available, upon request, to premedical students and their collegiate advisors.

On January 1, 1981, the Liaison Committee on Graduate Medical Education was transformed into the Accreditation Council for Graduate Medical Education. This change, which grew out of discussions held by the five sponsors in the newly formed Council for Medical Affairs, was accompanied by an increase in membership from two to four each for both the American Hospital Association and the Council of Medical Specialty Societies. The ACGME now has 20 members appointed by the sponsors, a public member, a resident member, and a non-voting federal representative.

The financing of accreditation activities for graduate medical education was also changed. A $25.00 a year charge for each resident was levied in addition to charges for accreditation surveys. During 1981 the AMA continued to support the ACGME by underwriting any deficits during the transition toward financial independence. Beginning December 1, 1981, the ACGME is expected to generate sufficient income to support all accreditation activities. The activities of the ACGME that relate to policy development will be financed by the five sponsoring organizations.

The bylaws of the ACGME require that staff services for the ACGME be provided by one of the five sponsors under the terms of a written memorandum of understanding. A subcommittee of the ACGME has met with AMA representatives to negotiate a memorandum with that organization. It is anticipated that a memorandum of understanding, to become effective December 1, 1981, will be approved by ACGME and its sponsors.

The ACGME has been empowered to authorize residency review committees to accredit graduate medical education programs under terms and conditions specified by the ACGME. Several RRCs have indicated a desire for such authority. Policies and procedures to delegate accreditation authority to requesting RRCs have been developed.

Other notable actions by ACGME this year were the ratification of the revised General Requirements Section of the Essentials of Accredited Residencies by all sponsors, the establishment of a process to implement accreditation of sub-specialty graduate medical education programs, and the initiation of procedures to accredit one year transitional programs.

At its May meeting the ACGME, after hearing a preliminary report of the AAMC's External Examinations Review Committee, requested a study committee review of the examination methods and eligibility standards currently employed by the Educational Commission for Foreign Medical Graduates for certifying graduates of non-LCME accredited medical schools for entry to accredited graduate medical education programs in this country.

In January 1981 the newly constituted Accreditation Council for Continuing Medical Education succeeded the Liaison Committee on Continuing Medical Education with the full participation of all original LCCME member organizations. This welcome reunification of the accreditation mechanism was carried out without difficulties. The new Council immediately undertook the task of completing a set of Essentials which had been under preparation by the previous organizations. After review and feedback by member organizations the ACCME approved the new Essentials in June and sent them to member organizations for approval.

Once these Essentials are approved, the Council will develop a companion handbook as a guide for the continuing education provider seeking accreditation and for the surveyors reviewing provider organizations and institutions. The handbook will take account of the multiple settings of CME represented by the various provider organizations and institutions.

Presently the ACCME is using a reverse site visit procedure for the re-accreditation review with the intent of assessing critically this review mechanism after one or two years of operation.

The Educational Commission for Foreign Medical Graduates continues to offer its examination for certification requirements of graduates of foreign medical schools, either U.S. citizens studying abroad or aliens with permanent residency in the U.S. All alien FMGs who require an entry visa must sit for the Visa Qualifying Examination developed by the NMBE and administered by the ECFMG. Despite a considerable decline in alien FMGs, the number of candidates for the ECFMG examination decreased in 1978 only temporarily to increase again due to the larger number of U.S. citizens studying medicine abroad and seeking admission to U.S. graduate medical education programs or to Fifth Pathway programs. An ECFMG Invitational Conference in October discussed issues of equivalency of education and examination. The ECFMG is also sponsoring a grant program supporting research and development in optimizing an FMG's educational experience in the U.S. graduate programs. A new scholarship program has also been approved for support of basic scientists who wish to gain teaching experience in U.S. medical educational institutions.

The Association worked closely with the NRMP in its revision of the Resident Matching Program for 1982. The revised match will permit students to be matched into programs that begin in the first graduate year and in later years. When fully adopted by teaching hospitals and program directors, the provisions of the new match should reduce pressures on students to make premature decisions to enter graduate medical education programs in certain specialties.

At the Association's request, the NRMP printed and distributed the Universal Application Form for Graduate Medical Education which had been developed after two years of study. The form was distributed to medical students at their schools for their use for applying to graduate medical education programs. The experience with the form in its first year of use will be studied to determine whether the distribution to students through their schools is an effective way to gain its acceptance by teaching hospitals and program directors.

This year the proposal by the Federation of State Medical Boards to establish a single route to licensure by requiring the passing of a two part Federation Licensing Examination sequence came under close scrutiny, and the Association's Executive Committee has met with Federation representatives to discuss their concerns.

The Coalition for Health Funding, which the Association joined with others in establishing 11 years ago, has expanded its activities and influence by monitoring and commenting on the development of the Congressional budget resolutions in addition to the traditional efforts on the appropriation process. The unpredictabilities in the evolution of the Congressional reconciliation process presented new challenges to the Coalition and emphasized the importance of cooperation with other organizations with similar interests. Efforts continue to refine the process by which the Coalition recommendations are developed and disseminated. Widespread acknowledgement of the usefulness of the Coalition's annual position on appropriations for the discretionary health programs offers significant evidence of the increasing respect in which the Coalition is held.

The diversity of the Association's interests and the nature of its constituency offers an unusual opportunity for liaison with numerous other organizations representing health care providers, higher education and those interested in biomedical and behavioral research. The Association is regularly represented in the deliberations of the Joint Health Policy Committee of the Association of American Universities/American Council on Education/National Association of State Universities and Land-Grant Colleges and in the Intersociety Council for Biology and Medicine. These liaison activities provide forums in which information on matters of national interest can be shared, varying points of view can be reconciled and collective actions undertaken in the area of federal legislation and regulation.

As a member of the Federation of Associations of Schools of the Health Professions, the AAMC meets regularly with members representing both the educational and professional associations of other health professions. This year FASHP has been especially concerned about health manpower legislation and budget and appropriations allocations for health manpower programs.

The Executive Committee of the Association met twice with their counterparts at the Association of Academic Health Centers. Among the agenda items at these meetings were the AAMC's new study on the General Professional Education of the Physician and the AAHC project to examine the impact of the federal budget on academic health centers.

Education

Various pressures during the last five to 10 years have focused attention on the need to assess the direction and effectiveness of our education systems. In elementary and secondary education concern about the impact of "innovative" educational philosophy and practice prompted a call for a "return to the basics." In no small way a continuing decline in the standardized test scores of graduating high school seniors was responsible for raising the alarm. The dwindling supply of public monies available during recent years to support education has placed increased emphasis on selectivity in the allocation of educational resources. This is clearly evident, for example, from reviewing recent tax support for medical education which has imposed more conditions relating to social goals to qualify for such support. Certain groups found education to lack appropriate moral fiber and have pressed for the reintroduction of spiritual values into the educational environment. In short, a variety of forces have combined to suggest a rather comprehensive reassessment of our educational mission and strategies at all levels.

In line with this trend, and having just completed an in-depth study of graduate medical education resulting in the report, *Graduate Medical Education: Proposals for the Eighties*, the AAMC has embarked on a major new venture involving a comprehensive examination of the post-secondary educational experiences preceding graduate study. Supported by a major grant from the Kaiser Family Foundation, the Association has initiated a three-year project to review and appraise the general professional education of the physician and college preparation for medicine to determine how education to the level of the M.D. degree can more effectively prepare students for their specialized education during graduate medical education and for lifelong professional learning. Under the direction of a special panel the project will involve institutional faculties and academic societies at medical schools and undergraduate colleges. The project is timely because it is now acknowledged that baccalaureate education and undergraduate medical education comprise the general preparation for a medical career. At a time when educational resources are limited, it is appropriate that faculties appraise their programs and determine how they can better accomplish their educational mission.

The Group on Medical Education has concentrated major attention on both of these areas in the development of its programs. Continuing a cooperative effort started in 1980, the GME coordinated an annual meeting program on house staff evaluation with the Association of Program Directors of Internal Medicine and the Society of Teachers of Family Medicine. This session combined the perspectives of those two specialties with that of surgery and also included an overview based on information collected for the AAMC Clinical Evaluation Project. The possibilities suggested by this combined interest for a more enduring form of assistance to graduate faculty are under active consideration.

The GME has also set in motion a phased effort to identify and analyze the issues it thinks merit consideration in the study of the General Professional Education of the Physician.

Another subject receiving particular attention at each GME Regional Meeting was the status of the Comprehensive Qualifying Examination under development by the National Board of Medical Examiners and its relationship to the proposal by the Federation of State Medical Boards for a FLEX I/FLEX II licensure process. The level of concern and interest generated in these meetings led to a 1981 annual meeting plenary session with the Group on Student Affairs. This session entitled, "The External Examination Dilemma: Impact on Student Behavior and Educational Programs," was viewed as an important step in encouraging informed faculty consideration of these issues and of the report of the AAMC ad hoc Committee on External Examinations Review.

The Clinical Evaluation Project continued to provide valuable data. In addition to its importance for the GME/APDIM/STFM session, it served as the basis for presentations to the January 1981 AAMC Residents Conference and the CAS Interim Meeting. The report series from the program is also now available. Information received from clinical faculty from approximately 500 departments is analyzed in terms of issues and problems surrounding evaluation of clerks and residents. Specialty-specific data are available for internal medicine, pediatrics, surgery, psychiatry, obstetrics-gynecology, and family medicine. The report series will serve as stimulus documents for three workshops which will provide a forum for faculty to address evaluation issues with regard to particular departmental needs. The Resident Conference itself was a useful forum for eliciting the views of senior residents on current evaluation practices in graduate medical education and for sharing these perceptions with key representatives of organizations with graduate education responsibilities.

The MCAT Interpretive Studies Research Program now provides a wide range of data to assist member schools in their use of MCAT score information. Cooperative validity studies with 27 schools are in progress; each is concerned with the relationship between the scores used in admissions and performance in medical school. Summaries of findings with regard to basic science performance are expected in the coming year. AAMC staff also disseminate research results on the national group of MCAT examinees through the MCAT interpretive studies series.

To assure that after five years the New MCAT science content is still current and necessary as a prerequisite to the study and practice of medicine, the AAMC is undertaking a limited review of the test's science content. The review for relevance as a prerequisite will be accomplished by 150 selected medical school faculty, while the currency of the science material will be assessed by undergraduate college science faculty.

While these necessary and productive activities are being implemented to support the admissions testing program, it continued to be necessary to dedicate significant attention to the problem posed by the threat of federal and state legislation to regulate standardized testing. At joint hearings of the House Subcommittees on Elementary, Secondary, and Vocational Education and Post-Secondary Education little new support for the legislation was in evidence, but professional organizations of testing specialists found an opportunity for the first time to voice their opposition in such a forum. Interest at the state level declined somewhat as reflected by the number of legislatures scheduling actions. Their review during the first half of 1981 failed to produce any new legislation. Meanwhile, the AAMC continues to offer the MCAT in New York under the protection of a preliminary injunction issued by a Federal District Court in New York while the constitutionality of the New York law is being reviewed.

The Continuing Education Systems Project initiated jointly with and supported by the Veterans Administration has completed the formulation of criteria for continuing education in the health professions incorporating the concepts of the adult professional as an independent learner into a set of institutional responsibilities for program planning and implementation. In close collaboration with the Regional Medical Education Centers and selected Learning Resource Centers of the Veterans Administration, the project is now developing a management and reporting system for continuing education and learning packages aimed at facilitating the application of these principles to the day-to-day operation of continuing education units in health profession schools and organizations. To test the validity of these concepts and of the criteria, the project has established close working relationships with a number of institutions and organizations including the Center for Educational Development at the University of Illinois, the Office of Research and Development for Education in the Health Professions at the University of North Carolina, the Office of Continuing Medical Education at Temple University and its affiliated hospitals, the American College of Physicians, the American Hospital Association, the Accreditation Council for Continuing Medical Education, the California Medical Association, and the Committee on Continuing Education of the American Dental Association. While the project is limited to the quality of continuing education per se, ultimately the goal is to assess the impact of educational intervention on the quality of health care rendered.

Another aspect of the continuing interest of the Association in assisting the promotion of quality in the educational process has been the involvement in the development of AVLINE (audiovisuals-online) as a mechanism for increased sharing of quality educational materials. Considerable effort has been expended towards developing criteria for acceptable quality of audiovisual educational materials, criteria which could guide the production as well as the critical assessment of such materials. With the assistance of the National Library of Medicine, the Educational Materials Project of the Association is promoting the concept of enhanced responsibility of the producer for quality of their productions and for the information needed to increase their potential usefulness in the instructional process.

Biomedical and Behavioral Research

Significant changes in the political and economic climate affecting biomedical and behavioral research, occurring simultaneously with increased evidence of the great potential or practical applications of new research findings, epitomized a paradox of unusual promise but profound uncertainty. The outgoing President proposed substantial rescissions in the appropriations for fiscal year 1981 for the National Institutes of Health and the research activities in the Alcohol, Drug Abuse and Mental Health Administration, along with budgetary proposals for fiscal year 1982 substantially below those required to maintain program levels. Subsequent events involved an almost bewildering array of funding proposals and counter-proposals as well as major modifications in the legislative process as the new Administration inexorably pressured Congress for adoption of its economic strategy. "Reconciliation" assumed sudden importance as a new term in the lexicon of scientists, and the outcome of Congressional battles concerning energy and transportation became highly important because of the peculiarities of legislative packaging. In part, because of strenuous efforts on its behalf but also because of fortuitous events, biomedical research fared comparatively well, both as far as proposed rescissions for FY 1981 and appropriations for FY 1982. Additionally, the National Research Service Award authority on which research training programs are dependent was renewed with several favorable features, especially as compared with initial proposals. Especially rewarding was the defeat of efforts to eliminate any possibility of institutional support as a part of training stipends. At the same time, the possibility of a worsening of the nation's economy and more drastic budgetary cuts in future fiscal years tempered a feeling of relief at the outcome of the legislative battles.

Despite the intense preoccupation of the Congress with economic issues, there were legislative proposals in other areas which could have significant impacts on biomedical and behavioral research. Particularly threatening were bills to establish dollar set-asides from the budgets of research-supporting agencies in order to exploit the putative capabilities of the country's small business to increase and improve "innovation." Along with other organizations, the Association vigorously criticized these proposals because the award of funds for research to small business firms would be outside the general competition with all other applicants based on scientific merit. Similarly threatening were proposals that would have required sequestration of substantial funds by NIH and other federal agencies to develop alternative methods to the use of animals in research.

More gratifying was the enactment of legislation that brought long-desired consistency to federal patent policy, including recognition of institutional patent agreements as a useful incentive for moving new discoveries into widespread application. There also were significant improvements in several pertinent regulations, prompted in part by the new anti-regulatory climate which developed after the last national election. Thus efforts to improve the regulations covering the disposal of radioactive wastes were largely successful. Changes by the National Institutes of Health in regulations governing research using recombinant DNA techniques represented similar advances, and the regulations governing the protection of human subjects in research were favorably modified after extensive negotiations in which the AAMC was involved. Unresolved, however, were the issues involving how the Occupational Safety and Health Administration would propose to regulate the use of toxic chemicals. Similarly persistent is the problem of time and effort reporting, an example of the difficulty in developing reasonable methods to demonstrate accountability for the use of federal funds. The subject of compensation for injured research subjects remains under consideration by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, with a pilot study being considered to explore the feasibility of a compensatory mechanism.

Increased competition for available research funds led to further discussions within the federal government, especially at NIH, and within organizations such as the Association on the increasingly nettlesome problem of the allocation of funds between direct and indirect costs. Although no specific restrictions occurred, it was apparent that research-oriented faculties and both the Administration and the Congress were increasingly determined that the ratio of funds allocated to the two types of costs should be examined, if not controlled. Institution officials, meanwhile, sought new ways to convince the critics of the essentiality of those expenditures and the needs for adequate reimbursement as justified in the support of any research program.

Prompted by the potential apparent for both medicine and other fields, particularly agriculture, in the enhanced ability to manipulate genetic material, new commercial ventures were started by faculty members to exploit the scientific and commercial possibilities. Numerous institutions and other organizations began to explore the complex issues in order that the public would gain by proper and prompt applications of these techniques, individual faculty members would receive their just scientific and financial rewards, and the fiscal and substantive integrity of academic institutions could be preserved.

Growing concerns abounded about the ability of the NIH, ADAMHA, and the Veterans Administration to recruit and retain senior scientific and managerial leadership as the attractiveness of federal employment for such individuals decreased. For example, there were more vacancies at senior level positions at the NIH than ever before in its history. In large part, the continuation of unreasonable ceilings on federal salaries was responsible. Given the current mood of the Congress, it seems unlikely that this situation will improve in the immediate future. At the same time, it was apparent that the general nature of federal employment had become significantly less attractive at such levels. The sudden resignation of Donald S. Fredrickson as Director of NIH dramatized this problem.

Health Care

Interest in the development of health maintenance organizations at academic medical centers prompted the Association to cosponsor a national conference with the Kaiser Family Foundation in October 1980. The conference proceedings, available from the Kaiser Family Foundation, will include summaries of discussions on issues such as the cost of conducting educational programs in prepaid practices, the compatibility between the service objectives of prepaid practices and the educational and research objectives of academic medical centers, and the effect of prepaid practice on faculty plans. These summaries, the papers presented by the major speakers, and the case histories of academic medical center/prepaid practice affiliations provide many insights into successfully developing relationships between academic medical centers and prepaid practices.

Two books prepared by the Association under a grant from the Health Care Financing Administration focused on the teaching of quality assurance and cost containment. The major text, a resource book for faculty and curriculum planners, explores ways in which the teaching of quality assurance and cost containment can be incorporated into the medical school curriculum and residency programs and then evaluated. The history and future trends in this area also are addressed. The companion volume, intended for use by medical students and residents, provides an overview of the rationale, principles and methodology involved in learning about quality assurance and cost containment. It offers a detailed case study that illustrates a five-stage approach to the conduct of a quality assurance study and provides a series of exercises to test the reader's ability to comprehend and apply the learning material. The books are currently in publication.

In October 1980 the Association began a project on aging and long term care. Under a cooperative agreement with the Administration on Aging, the AAMC provides technical assistance to institutions with AoA grants to plan or operate multidisciplinary long term care gerontology centers. It is intended that these centers become a national resource for needed services, research, and education and training in long term care.

The Association's primary role is as a facilitator to the long term care centers and projects in obtaining their goals. The Association, therefore, promotes an exchange of information on programs and organization at each of the centers and projects, and provides the services of experts in organizational development and long term care issues to the new and advanced planning centers. In addition, the Association is developing a management information system that will collect, analyze, and report data on the accomplishments of the operational centers.

To ensure that the project activities incorporate the views and concerns of the many different disciplines involved in long-term care centers and projects, the Association established a multidisciplinary project advisory committee. The committee met in January 1981 to review AAMC's planned activities and to express their views on the major long term care issues to be addressed in the 1980s. Its October 1981 meeting will review progress to date, advise the AAMC of future directions, and discuss ways in which interest in long term care can continue to be fostered in the nation's academic medical centers.

The AAMC has also conducted workshops on organizational and program planning issues and specific substantive areas such as research on the impact of the environment on the frail elderly, training of professionals who supply long term care in different settings and at different levels of intensity, long term care policy analysis and assessment, and approaches to developing innovative models of service. A third workshop is scheduled for May 1982. The exchange of information on long term care is further enhanced by the publication of a newsletter on the LTCGC program.

Faculty

In response to an Executive Council concern and on the recommendation of the *ad hoc* Committee on Clinical Research Manpower, the Association conducted several studies pertaining to the supply, training and career-long research productivity of clinical investigators. The studies were performed under contract from the Commission on Human Resources of the National Academy of Sciences and are being published by the National Institutes of Health. One study surveyed the amount of time physician faculty spend in research and research-related activities and found characteristically different career profiles of research involvement and publication among academic physicians in different specialties. Medical and behavioral specialists publish at rates that are sustained as their careers advance, while publications profiles of surgical and hospital-based specialists peak and then decline after about age 45. Published output from physicians in basic science departments peaks early and rises again later in their careers. By combining these profiles, assumptions regarding training and growth of faculty, and age-specific rates of faculty hiring and loss, total publication output can be projected.

Another study performed for the National Academy of Sciences compared the careers of physicians who received research training through four alternative programs: NIH postdoctoral fellowship training, the NIGMS medical scientist training program (MSTP), and the NIH research and clinical associates programs. All four programs were highly successful in producing physician scientists, but the MSTP was the most successful. MSTP graduates are more likely to continue their research involvement, publish more, and rise faster through the faculty ranks than the other three matched groups of physicians.

A third study examined whether there has been a change in successive graduating classes of MDs in the fraction who join medical school faculties. Using the Faculty Roster System to examine the classes of 1967 through 1974, it was found that, aside from variability in the early years after graduation, about 15 percent of each class had joined faculties within nine years of graduation. An anticipated declining trend was not observed. It was also noted that female graduates join faculties sooner and in greater proportions than do their male counterparts.

The rising numbers of faculty position vacancies in clinical departments, a cause of some recent alarm, was found to be proportionally matched by growing vacancies in basic science departments. Further studies, now in progress, examine whether PhDs are increasingly hired to fulfill research roles in clinical departments.

The Faculty Roster System, initiated in 1965, continues to be a valuable data base, containing information on current appointment, employment history, credentials and training as well as demographic data for all salaried faculty at U.S. medical schools. In addition to supporting AAMC studies of faculty manpower, the system provides medical schools with faculty information for use in the completion of questionnaires for other organizations, for the identification of alumni now serving on faculty at other schools, and for production of special reports.

The Faculty Roster supports a variety of manpower studies, including an annual descriptive study, funded in part by the National Institutes of Health. In 1980, *Trends in Medical School Faculty Characteristics, New Faculty and Continuing Faculty—1968–78,* was published. This report differs from previous faculty descriptive studies in its comparison of characteristics of newly hired faculty to existing faculty characteristics.

As of June 1981 the Faculty Roster contained information for 57,929 faculty; an additional 34,732 records are maintained for "inactive" faculty, individuals who have previously held a faculty appointment.

The Association maintains an index of

women and minority faculty, based on the Faculty Roster, to assist medical schools and federal agencies in their affirmative action recruiting efforts. The Faculty Roster staff has responded to 180 recruitment requests from medical schools by providing the records of selected faculty meeting the requirements set by the search committees. The faculty records utilized in this service are only those for which consent has been received from the individual faculty members.

The Association's 1980–81 *Report on Medical School Faculty Salaries* was released in February 1981, presenting compensation data for 118 U.S. medical schools and 31,712 filled full-time faculty positions. The tables present compensation averages, number reporting and percentile statistics by rank and by department for basic and clinical sciences departments. Many of the tables also allow comparisons according to type of school ownership, degree held, and geographic region.

Students

As of August 1981, 36,497 applicants had filed 337,075 applications for the entering class of 1982 in the 126 U.S. medical schools. These totals, although not final, already surpassed the final figures for the entering class of 1981.

First-year enrollment increased from 16,930 in 1979–80 to 17,186 in 1980–81 while total enrollment rose from 63,800 to 65,189. This increase represents the smallest growth in enrollment in the past five years; however, the actual number enrolled establishes a new record. A portion of the increase is attributable to a rise in the number of all minorities enrolled since 1979–80. However, the number of underrepresented minority students enrolled remains virtually unchanged since last year.

First-year enrollment of women medical students reached 4,966, a 5.4 percent increase since 1979–80, while the total number of women enrolled was 17,248, a 6.9 percent increase. In 1980–81 women constituted 28.9 percent of the first-year class and 26.5 percent of all medical students.

The application process was facilitated by the Early Decision Program and by the American Medical College Application Service. For the 1981–82 first-year class 958 applicants were accepted by the 62 participating medical schools. Since each of these applicants filed only one application rather than the average of 9.2 applications, the processing of approximately 7,850 multiple applications was avoided. In addition, the program allowed the successful early decision applicants to finish their baccalaureate programs free from concern about admission to medical school.

Ninety-seven medical schools used AMCAS to process first-year application materials for their 1981–82 entering class. In addition to collecting and coordinating admission data in a uniform format, AMCAS provides rosters and statistical reports and maintains a national data bank for research projects on admission, matriculation and enrollment. The AMCAS program is guided in the development of its procedures and policies by the Group on Student Affairs Steering Committee.

The Advisor Information Service circulates rosters and summaries to AMCAS applicants who have authorized the release of personal information to their health professions advisors. In 1980–81, 209 health professions advisors subscribed to this service.

During each application cycle, the AAMC investigates the application materials of a small percentage of prospective medical students with suspected irregularities in the admission process. These investigations, directed by the AAMC "Policies and Procedures for the Treatment of Irregularities in the Admission Process," help to maintain high ethical standards in the medical school admission process.

The number of Medical College Admission Test examinees for 1980 and the projected total for 1981 appear to indicate a general slowing of the rate of decrease in the number of MCAT examinees evidenced over the past five years. With the exception of the artificial increase in the number of examinees in 1977 because of the introduction of the New MCAT, decreases in the number of MCAT examinees between 1975 and 1979 were of the magnitude of 2500-3000 examinees per year. This is contrasted with a 3 percent increase in 1980 over 1979 and a projected return to 1979 levels for the two administrations in 1981. While the total number of examinees appears to be stabilizing, the percentage of women examinees continues to increase. In 1980, 34 percent of all examinees were women, compared to 27 percent in 1977. Although the changes in the racial ethnic composition of the 1980 examinee group were very small, there was a decrease in the number of white examinees while the various underrepresented minorities maintained essentially the same percentages of the examinee pool as in 1979.

The Medical Sciences Knowledge Profile examination was administered for the second time in June 1981 and 1,776 citizens or permanent resident aliens from the U.S. and Canada sat for the examination. The examination is provided to assist constituent schools of the AAMC in their deliberations about individuals seeking advanced placement. The MSKP program is sponsored by the AAMC and the test is developed and administered by the National Board of Medical Examiners.

While 5.7 percent of those registering for the test have degrees in other health professions, 87 percent of all registrants indicated they were currently enrolled in a foreign medical school. The total number of examinees for the 1981 administration was only 20 fewer than the number who sat for the first MSKP examination in 1980.

A two-year grant from the Department of Health and Human Services for the AAMC's Simulated Minority Admissions Exercise Workshops was successfully completed in December 1980. The grant supported sixteen SMAE Workshops held at various medical schools across the country and involved over 500 medical school personnel including deans, department chairpersons, admissions officers, faculty and others in student affairs. The SMAE Workshops developed by the AAMC in 1974 assist admission committees to evaluate noncognitive information on nontraditional (minority) applicants to medical school. Most recently, the Office of Health Resources Opportunity has officially notified the AAMC of the award of a new grant to support a series of workshops to be held at several medical schools in each region. These will include retention and learning skills workshops, training and development workshops for student financial aid program administrations, and a counseling workshop for minority and financially disadvantaged students accepted to medical school and for premedical advisors. Simulated Minority Admissions Workshops will also be offered to medical schools.

Efforts continued to improve the availability and types of financial assistance for medical students and the administrative expertise of medical school financial aid officers. Attempts by both the 96th and 97th Congresses to pass legislation in the areas of health manpower and education that would impact on the entire spectrum of financial aid programs available to medical students were carefully monitored. Testimony and written comments were delivered at each appropriate opportunity. Three workshops to improve the administration of financial aid at schools of medicine, osteopathy and dentistry were held during 1980–81. The grant from the Robert Wood Johnson Foundation supporting this activity will provide three more such programs.

The annual medical student graduation questionnaire was administered to the class of 1981 in 119 of the 121 medical schools with seniors. Approximately 11,000 students participated in the survey, a response rate of 69 percent. A summary report comparing national responses with individual institutional data was mailed to each medical school during the summer. Selected results appear in the 1981 Directory of the National Residency Matching Program. A comprehensive study of 1981 graduates is underway.

After two years of careful study, review, and refinement, the Graduate Medical Education Application for Residency, developed by the AAMC at the recommendation of the Task Force on Graduate Medical Education and provided by the National Resident Matching Program, was implemented this spring. Applications were disseminated, along with NRMP materials, to medical school student affairs offices for use by students planning to enter residency programs. This universal application will facilitate the process of applying for a residency position by providing a standard form for transmittal of basic information from students to hospital program directors. Program directors may request supplemental information from applicants.

In 1980–81 at the suggestion of the Group on Student Affairs "Recommendations of the AAMC Concerning Medical School Acceptance Procedures" were modified to include the provision that all schools offer sufficient places to fill their first-year class by May 15 of each admission cycle. This strategy should lessen the tension in both schools and students produced by the acceptance of large numbers of students during the summer months.

The Group on Student Affairs-Minority Affairs Section has initiated activities outlined in the implementation plan for the recommendations of the AAMC Task Force on Minority

Student Opportunities in Medicine. The first activity, a medical career awareness workshop for high school and college minority students, was conducted April 1981, in Dayton, Ohio.

A grant-in-aid was received from the Commonwealth Fund to produce a book with the working title, "U.S. Medical Students, 1950-2000: Trends and Projections." To help develop meaningful predictions regarding the characteristics of future medical students, a four-round Delphi Survey was initiated. Among the 330 participants in the survey are medical school administrators, faculty and students, preprofessional advisors, Flexner awardees and other opinion leaders. The book is scheduled for publication in 1983.

Institutional Development

In 1972 the Association initiated a program to strengthen the management of medical schools and academic medical centers. The Management Advancement Program continues to develop and conduct educational seminars, to analyze management issues, and to assist in the identification of appropriate consultant services. To date, fifty seminars have been offered; participants from 125 U.S. and 13 Canadian medical schools and 146 hospitals have participated.

The program was designed to assist institutions in the development of goals that would effectively integrate organizational and individual objectives, to strengthen the decision-making and the problem-solving capabilities of academic medical center administrators, to aid in the development of strategies and mechanisms that would allow medical schools and centers the flexibility to adapt more effectively to changing environments, and to develop a better understanding of the function and structure of the academic medical center.

The chief activity of the program this year has been the conduct of Executive Development Seminars for senior academic medical center administrators, an intensive week-long seminar on management theory and technique. During the 1980–81 year there were Executive Development Seminars for medical school deans, teaching hospital directors, chairmen of medicine, service chiefs of affiliated hospitals, and chairmen of pathology. A special seminar was offered for teams of business officers and institutional planners from twenty institutions. The third seminar for women in senior administrative roles in academic medicine was also held. In conjunction with the Veterans Administration central office, a program focused on the academic medical center-VA hospital affiliation relationship was conducted for VA hospital deputy directors as part of their professional development program in the fall of 1981. Plans are underway for additional programs for chairmen of obstetrics/gynecology, pediatrics, and general surgery. A second seminar for business officers and institutional planners will be offered in the spring of 1982.

The Management Advancement Program was planned by an AAMC Steering Committee which continues to participate in program design and monitoring. Faculty from the Sloan School of Management, Massachusetts Institute of Technology, have played an important role in the selection and presentation of seminar content. Consulting expertise has been provided by many individuals including faculty from Harvard University Graduate School of Business Administration, the University of Oklahoma College of Business Administration, the Brigham Young University, the University of North Carolina School of Business Administration, and the George Washington University School of Government and Business Administration. Initial financial support for the program came from the Carnegie Corporation of New York and from the Grant Foundation. Funds for MAP implementation came primarily from the Robert Wood Johnson Foundation. The program is now self-supporting through the use of conference fees.

In 1976 the Management Education Network was designed to identify, document and transmit management information relevant to medical center settings. Supported from the National Library of Medicine, products from the MEN project include a study guide and companion audiovisual tapes on strategic planning, a study on medical school departmental review, and a simulation model and companion study on tenure and promotion in academic medical centers. The final report of the study of academic tenure was distributed this past year. During the course of the tenure study the information developed has been made available to many medical schools concerned with tenure questions.

The studies of the career patterns of medical school deans and vice presidents for health sciences and their implications for medical school leadership and management are continuing, supported by the Commonwealth Fund, and will be published shortly.

The exponential growth of medical knowledge and revolutionary changes in information handling technology present important challenges to academic medicine. In response, the AAMC has undertaken studies on the future of health sciences libraries and on information handling in medical schools and hospitals. The primary focus of the health sciences library study is the library's mission and roles in education, research and patient care. Using diverse data collection instruments and with the support of an enthusiastic advisory committee, this study has as its objective the identification of policy issues and planning principles for institutional decision makers. The study aspires to provide workable models for library and learning resources management to assist in determining priorities for action and assessing needs for staff skills development. The study of the health sciences library is supported by the National Library of Medicine for two years, targeted for completion in 1982.

The study of information handling technology for hospital and medical school functions is supported by The Josiah Macy, Jr. Foundation. This eighteen month study will assist in strategic planning for information management in the academic medical center. Tasks of the study are to collect, analyze, and disseminate information about available and new technology and to provide a basis for assessing the impact of technology on the information handling functions of the academic medical center. Current information handling practices will be described; areas where there is substantial potential for change will be identified and policy issues associated with potential changes will be discussed.

One important value of these studies already apparent is their catalytic effect in stimulating dialogue among institutional officials with diverse information handling needs and responsibilities. These discussions are leading to new perspectives on the possibilities for greater intra-institutional cooperation and coordination of related tasks.

Teaching Hospitals

The Association's teaching hospital activities were concentrated in six areas during 1980–81: the budget reconciliation acts of 1980 and 1981; health care competition; legislative and regulatory analysis; house staff unionization; a major study of teaching hospitals; and surveys and publications.

For the first time in the Congressional budget process, a House-Senate conference committee began work in mid-September 1980 to resolve differences between two versions of a budget reconciliation bill for trimming the federal government's budget for fiscal year 1981. In this process, AAMC supported a provision in the House bill that would repeal Section 227 of the Social Security Act, the highly controversial Medicare provision which discriminated against physicians caring for patients in teaching hospitals. The Association opposed certain provisions in the Senate bill relating to Medicaid and Medicare which would have been harmful to teaching hospitals. The final budget reconciliation act signed by President Carter contained many Medicare-Medicaid reimbursement reforms, including the AAMC-supported provision which repealed Section 227 of the 1972 Social Security amendments and added new guidelines for paying teaching physicians. The amendment did retain the original Section 227 provision allowing cost reimbursement when elected by all physicians in the hospital. While the list of Medicare-Medicaid amendments was extensive, the House-Senate conferees dropped from the final measure four of the five controversial provisions strongly opposed by the AAMC.

President Reagan's fiscal year 1982 proposed budget called for the imposition of an "interim cap" to limit federal payments under the Medicaid program to $100 million less than the current spending estimate for fiscal year 1981, with a five percent increase above this amount in fiscal year 1982. Increases beyond that fiscal year would simply be adjustments for inflation. In return for the reduction in federal support, states would be given increased control over Medicaid eligibility, benefits and reimbursement policies.

To assist in the development of its position, strategy, and testimony concerning the Administration's Medicaid proposal, and to help substantiate the significant role teaching hospitals have in caring for Medicaid patients and the importance of adequate payment for these services, the Association surveyed its teaching hospital members on their Medicaid activities. Citing preliminary statistics from the survey, the Association testified before the Senate Committee on Finance on the proposed Medicaid cap and emphasized that the Administration's proposal would have several adverse effects on teaching hospitals. These included increased hospital bad debts and charity requirements, increased hospital financial distress, increased hospital prices for charge-paying patients, a reversal of hospital accomplishments in providing a one-class standard of care, and creation of a serious barrier to the Administration's interest in competition. The Association urged the Committee to reject the proposed Medicaid budget reductions and to examine other areas of the proposed federal budget where reductions would not have the devastating impact of Medicaid program cutbacks. In addition, the AAMC strongly opposed a denial-of-choice provision which would give the HHS Secretary the authority to permit states to mandate, on a least cost basis, a Medicaid recipient's physician and hospital.

Throughout the spring the AAMC conveyed to members of Congress its opposition to various proposed Medicaid and Medicare budget cuts. Written testimony was submitted to the House Health Subcommittee on the Medicaid component on the Administration's proposed "Health Care Financing Amendments of 1981," which contained the legislative language necessary to implement the proposed federal cap. After careful consideration of the provisions of the House and Senate reconciliation bills, the AAMC Executive Council concluded that the House bill was preferable in most respects to the Senate bill. However, the Association targeted certain Medicare and Medicaid provisions in the House version for opposition. The final reconciliation package signed by President Reagan included milder forms of some of the provisions opposed by teaching hospitals. The Administration's proposed Medicaid cap was replaced by reductions of 3 percent in federal Medicaid funding in fiscal year 1982; 4 percent in 1983; and 4½ percent in 1984. These reductions could, however, be minimized or eliminated entirely if certain specified criteria are met by the state.

Since the defeat of President Carter's hospital cost containment legislation in 1979, increasing attention has been given to ways of injecting price competition into the health care marketplace to stimulate cost consciousness among providers and consumers. Many advocates see the competitive approach as an alternative to regulations and mandatory controls on health care costs. An AAMC *ad hoc* Committee on Competition met to explore the implications of price competition for teaching hospitals. Its draft report was accepted by the Executive Council and developed into a monograph, "Price Competition in the Health Care Marketplace—Issues for Teaching Hospitals." This widely distributed document raises important issues that must be understood and addressed in the debate on competition legislation. Advocates of price competition recognize that teaching hospitals have multiple products which benefit not only individual patients, but society as a whole. The commonly offered solution is to identify and publicly fund these additional activities based on their own merits. However, the AAMC has emphasized that attempts to segment the unique characteristics of teaching hospitals into measurable units risk ignoring that their contributions are the products of inter-related programs, which together provide the environment and resources required for teaching future health manpower and advancing medical knowledge and practice.

In 1980 the Senate Subcommittee on Health and Scientific Research considered two bills to provide assistance to financially failing hospitals. The AAMC provided testimony for the hearing record in support of the bills with certain modifications. Of particular concern was the effect of the hospitals' fiscal stringencies on their graduate medical education programs.

The AAMC agreed that federal action was necessary to adequately address the problem. Noting that hospitals which serve large numbers of medically indigent and poor patients need long-term solutions which modify the financing of health services for those populations, the AAMC urged immediate, external assistance that could include modifications in Medicare Section 223 limitation procedures, Medicare and Medicaid participation in hospital bad debts, special project funds to modernize facilities, and special project grant programs for hospital operations. While supporting both pieces of legislation as interim, emergency measures for transitory relief to financially troubled hospitals on the brink of closure, the AAMC emphasized that without long-term reforms to address the inequities of current reimbursement policies and the gaps in health insurance coverage, these measures would do little more than temporarily veil the continuing threat of bankruptcy and closure for these hospitals.

While such legislation was eventually tabled, the Health Care Financing Administration published a notice soliciting applications from state Medicaid agencies for demonstration projects to improve the efficiency of services and management in financially troubled hospitals in medically underserved rural and inner-city areas. Under this program HCFA granted $11 million for health maintenance organization/hospital oriented projects at teaching hospitals in Boston, Jacksonville, and Los Angeles.

The Association commented on proposed HCFA regulations making changes to the Conditions of Participation for Hospitals under the Medicare and Medicaid programs. While generally supportive of the potential for allowing hospitals greater flexibility in performing administrative and managerial functions, the Association identified a number of areas of concern and presented comments and recommendations regarding 52 technical issues.

The AAMC also commented on proposed HCFA regulations establishing incentive reimbursement for outpatient dialysis and self-care dialysis training. The Association noted that the proposed regulations recognized and provided for different reimbursement rates for hospital-based and independent (free-standing) dialysis services, and urged this distinction be retained. The AAMC was concerned, however, that the proposed regulations included a detailed statistical methodology for calculating the incentive reimbursement rate in the admitted absence of adequate data. The Association asked HCFA to delay promulgation of incentive reimbursement rates until appropriate data could be collected and the impact of the rates on beneficiaries and providers could be analyzed.

In the area of health planning, the Office of Management and Budget proposed establishing policies and procedures to halt federal financial support for hospital construction in overbedded areas. The AAMC expressed several concerns about the memorandum, foremost being its disregard for the capabilities of the existing health planning structure to monitor hospital construction. The incoming Reagan Administration later rescinded the OMB memorandum.

Final regulations were issued establishing the minimum requirements for satisfactory certificate of need review programs under amendments to the health planning law. A major concern about the status of proposed capital expenditures or major medical equipment acquisitions for research and training was addressed in the final CON regulations, which emphasized that: "Only clinically related services are included in the definition of institutional health services; consequently, research services *per se* are not required to be subject to review. Capital expenditures are required to be reviewed only if they are made by or on behalf of the health care facility. Major medical equipment acquired for research purposes need not be subject to review if the equipment will not be used to provide services to inpatients of a hospital."

The Health Programs Extension Act of 1980 also contained several health planning amendments. The AAMC worked closely with Congressional staff to develop an amendment providing an exception to the existing CON requirements for the acquisition of major medical equipment, provision of institutional health services, or the obligation of capital expenditures undertaken solely for purposes of research.

The AAMC commented on the proposed national health planning goals on health status outcomes, disease prevention and health promotion, and institutional and personnel resources. The Association criticized the planning goals as lacking a sense of realism and consistency, for there was no discussion of the cost and funding implications of pursuing such goals. The Association also emphasized that it was the expressed intent of Congress that decisions about applicability of the goals and standards be made at the local level. A final version of these goals has yet to be published. Regarding the future of the overall health planning program, the AAMC's Executive Council identified several critical deficiencies of the program and its implementation and did not make the planning act a priority for Association action.

In July 1980, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the National Labor Relations Board acted within its statutory authority in its March 1979 *Cedars-Sinai* decision which declared that interns and residents are primarily students rather than employees for coverage under the National Labor Relations Act. The AAMC was *amicus curiae* in the case supporting the NLRB's position, as well as in the original *Cedars-Sinai* case. The Court of Appeals case was brought by the Physicians' National Housestaff Association after an earlier U.S. District Court decision concluded the court had no jurisdiction to review the NLRB's decision. The case, *PNHA v. John H. Fanning et al.*, was then appealed to the U.S. Supreme Court, which denied the motion and left standing the lower court determinations.

During the past year the AAMC participated as *amicus curiae* before the Federal Labor Relations Authority in two cases in which PNHA sought to represent house staff enrolled in graduate medical education programs at Veterans Administration medical centers. The Association also submitted *amicus curiae* briefs before the California Public Employment Relations Board, in a case considering unionization for house staff at hospitals owned and operated by the state, and the NLRB, in the case of *Children's Hospital of Los Angeles v. Interns and*

Residents Association of Children's Hospital. The outcomes of these cases are pending.

The COTH Spring Meeting included a progress report on the Association's major descriptive study of teaching hospitals. With guidance from the *ad hoc* Committee on the Distinctive Characteristics and Related Costs of Teaching Hospitals, the Association's staff developed a methodology for the study. Thirty-three COTH member hospitals submitted a computer tape of their fiscal year 1978 patient discharge abstracts and bills. In addition, hospitals supplied Medicare cost reports, audited financial statements, annual reports, and patient origin studies. Finally, questionnaires on educational programs, hospital staffing and patient services were completed by the study hospitals. During 1980–81 staff completed a major portion of the analysis of the data received. The patient abstract and billing information for more than 500,000 patient records has been analyzed using two case mix measures: diagnosis related groups and disease staging. Data from the three questionnaires and other hospital reports are being prepared for a final report, expected to be available in early 1982. It will present findings on facilities and services, educational programs, hospital staffing, financial characteristics, and patient case mix.

In June 1981, the Association staff completed an analysis of construction projects begun in 1979 among COTH non-federal member hospitals. It was found that 68 percent of the funding of such projects was financed by some form of debt, a dramatic change from 1969 when only 20 percent of such capital was borrowed or financed through debt. Results of the latest survey, which were compared with the pattern of funding for construction projects begun in 1974 and those completed in 1969, were presented in the *COTH Report*, a comprehensive hospital issues-oriented newsletter published ten times annually.

In addition to the newsletter, the Association has maintained its program of regular membership reports and surveys. The Association distributed a revised version of the paper entitled "Toward A More Contemporary Public Understanding of the Teaching Hospital," originally presented at the 1979 COTH Spring Meeting. *The COTH Directory of Educational Programs and Services* was published for the thirteenth consecutive year, providing an operational and educational program profile of each COTH member. House staff stipend and fringe benefit information was again published in the *COTH Survey of House Staff Stipends, Benefits, and Funding.* The Association also published datagrams in the *Journal of Medical Education* on the topics of teaching hospital construction funding, university-owned teaching hospital income, and house staff compensation and funding.

Communications

During the year the AAMC employed a variety of publications, news releases, news conferences and personal interviews with representatives of the news media to communicate its views, studies, and reports to its constituents, interested federal representatives, and the general public.

More than 20 news media interviews and requests for information and policy statements are initiated or responded to by AAMC staff each week. This media interaction has, in part, been responsible for the editors of *U.S. News and World Report*, for the fifth consecutive year, naming the Association's President "as one of the five most influential leaders in the health field in the U.S." In compiling their list of influential persons in several categories, *U.S. News and World Report* surveys journalists, Capitol Hill staffers and members of Congress.

The most important publication used by the Association to inform its constituents is the *President's Weekly Activities Report*. This report, which is issued 43 times a year and reaches about 9,000 readers, reports on AAMC activities and federal activities that have a direct effect on medical education, biomedical and behavioral research, and health care.

The *Journal of Medical Education* in fiscal year 1981 published 1,045 pages of editorial material in the regular monthly issues, compared with 1,039 pages the previous year, including 88 regular articles, 72 Communications, and 10 Briefs. The *Journal* also continued to publish editorials, datagrams, book reviews, letters to the editor, and bibliographies provided by the National Library of Medicine.

The volume of manuscripts submitted to the *Journal* for consideration continued to run high. Papers received in 1980–81 totaled 421; 130 were accepted for publication, 203 were rejected, 10 were withdrawn, and 78 were pending as the year ended. The *Journal's* monthly circulation averaged about 6,500, an increase of 100 compared with 1980. During the year, special issues were devoted to geriatrics and medical education and to the AAMC Annual Meeting plenary session addresses. The AAMC's Annual Report and Annual Meeting program were published as a supplement.

About 32,000 copies of the annual *Medical School Admission Requirements*, 4,500 copies of the *AAMC Directory of American Medical Education*, and 8,000 copies of the *AAMC Curriculum Directory* were sold or distributed. Numerous other publications, such as directories, reports, papers, studies, and proceedings, also were produced and distributed by the AAMC.

The *COTH Report* is the newsletter of the Association's Council of Teaching Hospitals. It is published 10 times annually and is distributed to more than 2,600 subscribers. The newsletter provides a comprehensive review of Association and COTH activities; federal legislative and regulatory issues of relevance to the academic medical/teaching hospital community; pertinent surveys, studies, reports and other publications; and current health care topics of interest. Other newsletters include the *OSR Report*, which is circulated twice a year to medical students; *STAR* (Student Affairs Reporter), which is printed twice a year and has a circulation of 1,000; and the *Council of Academic Societies Brief*, which is published four times a year and has a circulation of 5,000.

Information Systems

The Association has a general purpose computer system to support its information requirements. This in-house system facilitates the optimum use of the Association's information resources for its programs. The development and use of the information systems have increased significantly during the past year, and the Association's activities are now enhanced by comprehensive student, faculty, and institutional data systems.

The information systems on medical students continue to develop and expand. Work continues on a unified system to monitor students from their pre-medical years through the application process, medical school, and into the first years of post-M.D. experience. This system will provide the basis for both historical perspective and current information on medical students in the United States.

The heart of the medical student information system is the American Medical College Application Service system. This system supports the Association's centralized application service by capturing data on applicants to medical school and linking applicant data with the MCAT test scores and academic record information for each applicant. Medical schools and applicants are informed of the application process through daily status reports, and medical schools regularly receive rosters of applicants and summary statistics which compare their applicants with the national applicant pool. Each applicant's record is immediately available via computer terminal to appropriate Association personnel responding to telephone inquiries from applicants and medical school personnel.

The information in the AMCAS system is the basis for special reports generated throughout the year and provides answers to questions posed by medical school personnel and Association staff. The AMCAS system is also used for regular descriptive studies of medical school applicants as well as more focused, issued-oriented studies.

A number of other data systems supplement the AMCAS information on medical students. Among these are the Medical College Admission Test reference system, which contains MCAT score information for all examinees; the college system, which contains information on all U.S. and Canadian colleges and universities; and the Medical Sciences Knowledge Profile system on individuals applying to take the MSKP exam for advanced standing admission to U.S. medical schools.

Information on students enrolled in U.S. medical schools is maintained in the student records system. This system, maintained in cooperation with the medical schools, follows the progress of medical students from matriculation through graduation. The information in the student records system is supplemented periodically through the administration of surveys, such as the Graduation Questionnaire and the financial aid survey, to specific groups or samples of medical students.

The Association maintains two major information systems on medical school faculty. The faculty roster system includes information on the background, current academic appointment, employment history, education, and training of all salaried faculty at U.S. medical schools. This information is maintained in cooperation with medical school staff by Association personnel having online access and capability to update the information. Data in the Faculty Roster system are periodically reported to the medical school in summary fashion, enabling the schools to obtain an organized, systematic profile of their faculty. The faculty salary survey system contains information from the Association's annual survey of medical school faculty salaries. This information is used for the annual report on medical school faculty salaries and is available on a confidential, aggregated basis in response to special inquiries from the schools.

The Association maintains a number of institutional information systems, including the

Institutional Profile System, a repository for information on medical schools. Information is entered both directly from surveys sent to the medical schools and through other information systems, from which data are aggregated by medical school. The information is maintained in a data base supported by a software package that allows immediate user retrieval via computer terminal. The system is used to respond to requests for data from medical schools and other interested parties, and to support a variety of research projects. There are over 20,000 items of information currently in IPS describing many aspects and characteristics of medical schools from the early 1960s through the present.

An ancillary system to the Institutional Profile System has been developed to process Part I of the Liaison Committee on Medical Education annual questionnaire. This allows data input and on-line editing of the data, and generates reports that identify errors and inconsistencies in the data on the questionnaires and compare the values from the current year with those reported from the previous four years. This system produces information used in the report of medical schools' finances which appears in the annual education issue of the *Journal of the American Medical Association.*

Information on the teaching hospitals is also maintained. The Association's program of teaching hospital surveys combines four recurring surveys with special issue oriented surveys. The annual surveys are the educational program and services survey, the house staff policy survey, the income and expenses survey for university-owned hospitals, and the executive salary survey. These serve as the basis of four annual reports generated by the Association and provide answers to special requests made by the member hospitals.

Data collection and information dissemination efforts of the Association continue to give attention to special areas or issues of concern to medical education. Among the areas currently receiving focused attention are the status of women in academic medicine, the status of medical practice plans in the medical schools, and the case mix of patients in teaching hospitals. The Association staff will continue to use all available information resources to focus on these and other areas of importance to academic medicine.

AAMC Membership

Type	1979-80	1980-81
Institutional	116	123
Provisional Institutional	10	3
Affiliate	16	16
Graduate Affiliate	1	1
Subscriber	18	18
Academic Societies	69	71
Teaching Hospitals	423	410
Corresponding	40	28
Individual	1,384	1,301
Distinguished Service	48	52
Emeritus	62	50
Contributing	15	4
Sustaining	14	12

Treasurer's Report

The Association's Audit Committee met on September 4, 1981, and reviewed in detail the audited statements and the audit report for the fiscal year ended June 30, 1981. Meeting with the Committee were representatives of Ernst & Whinney, the Association's auditors, and Association staff. On September 11, the Executive Council reviewed and accepted the final unqualified audit report.

Income for the year totaled $9,474,657. Of that amount $8,034,218 (85%) originated from general fund sources; $241,112 (2%) from the foundation grants; $1,199,327 (13%) from federal government reimbursement contracts.

Expenses for the year totaled $8,726,381 of which $7,074,083 (81%) was chargeable to the continuing activities of the Association; $293,099 (3%) to foundation grants; $1,199,327 (14%) to federal cost reimbursement contracts; $159,872 (2%) to Council designated reserves. Investment in fixed assets (net of depreciation) increased $270,228 to $1,020,163.

Balances in funds restricted by the grantor increased $100,210 to $470,996. After making provisions for reserves in the amount of $250,000 principally for special legal contingencies and MCAT and AMCAS development, unrestricted funds available for general purposes increased $80,357 to $6,775,972, an amount equal to 78% of the expense recorded for the year. This reserve accumulation is within the directive of the Executive Council that the Association maintains as a goal an unrestricted reserve of 100% of the Association's total annual budget. It is of continuing importance that an adequate reserve be maintained.

The Association's financial position is strong. As we look to the future, however, and recognize the multitude of complex issues facing medical education, it is apparent that the demands on the Association's resources will continue unabated.

Association of American Medical Colleges
Balance Sheet
June 30, 1981

ASSETS		
Cash		$ 8,852
Investments		
Certificates of Deposit		11,148,085
Accounts Receivable		715,356
Deposits and Prepaid Items		51,052
Equipment (Net of Depreciation)		1,020,163
Total Assets		$12,943,508
LIABILITIES AND FUND BALANCES		
Liabilities		
Accounts Payable		$ 776,567
Deferred Income		1,765,805
Fund Balances		
Funds Restricted by Grantor for Special Purposes		470,996
General Funds		
Funds Restricted for Plant Investment	296,856	
Funds Restricted by Executive Council for Special Purposes	1,837,149	
Investment in Fixed Assets	1,020,163	
General Purposes Fund	6,775,972	9,930,140
Total Liabilities and Fund Balances		$12,943,508

Association of American Medical Colleges
Operating Statement
Fiscal Year Ended June 30, 1981

SOURCE OF FUNDS	
Income	
Dues and Service Fees from Members	$2,456,689
Grants Restricted by Grantor	241,112
Cost Reimbursement Contracts	1,199,327
Special Services	3,647,896
Journal of Medical Education	79,675
Other Publications	325,627
Sundry (Interest $1,172,326)	1,524,331
Total Income	$9,474,657
Reserve for Special Legal Contingencies	50,000
Reserve for CAS Services Program	-0-
Reserve for Special Studies	11,809
Reserve for Minority Programs	-0-
Reserve for Patient Intensity Program	39,757
Reserve for Personal Assessment	31,031
Reserve for House Staff Meetings	27,275
Total Source of Funds	$9,634,529
USE OF FUNDS	
Operating Expenses	
Salaries and Wages	$4,035,707
Staff Benefits	599,452
Supplies and Services	3,180,592
Provision for Depreciation	209,314
Travel and Meetings	697,730
Loss on Disposal of fixed assets	3,586
Total Expenses	$8,726,381
Increase in Investment in Fixed Assets (Net of Depreciation)	270,228
Transfer to Executive Council Reserved Funds for Special Programs	250,000
Reserve for Replacement of Equipment	207,353
Increase in Restricted Fund Balances	100,210
Increase in General Purposes Fund	80,357
Total Use of Funds	$9,634,529

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Christel A. Woodward and Barbara M. Ferrier

Microcomputers and Computer-Based Instruction
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Factors Influencing Decisions To Enter Careers in Clinical Investigation

Wayne K. Davis, Ph.D., and William N. Kelley, M.D.

Abstract—Factors associated with decisions to enter careers in clinical research were studied based on surveys completed by successful clinical investigators. Three aspects of career decision-making were explored: the timing of the decision to enter a research career, the relationship between research success and the timing of the decision, and the impact of two disincentives to enter research careers (the payback provisions of the national research service awards and the abolition of the physician draft that decreased the attractiveness of research training as an alternative). Survey results document the importance of medical school experiences in career decisions. Further, the correlation between the time of career decision and research success supports arguments for early research experiences upon which decisions can be made. Disincentives for entering a research career were not seen as barriers that would have prevented the majority of respondents from entering a research career. The results of the study led to a strong recommendation that research opportunities for medical students be enhanced as one mechanism for positively influencing decisions in favor of research careers.

The biomedical research community has become increasingly concerned with the declining number of clinical investigators. Evidence of this problem has included a reduced interest in research careers expressed by medical students (1), the shift from M.D. to Ph.D. trainees in research fellowship positions provided through the National Research Service Award (NRSA) Program (2), the reduced number of new National Institutes of Health-funded principal investigators holding M.D. degrees (2), and the large number of open faculty positions in clinical departments (3). Not only is there abundant evidence of a real and significant decline in the number of physician researchers, but also there is a projected increase in the magnitude of the problem with the diminished numbers of medical students reporting an interest in research. It is important, therefore, to determine the reasons for this decline so that solutions to the problem may be developed.

While there are no data currently available to delineate the reasons for the decline in research interests among young physicians, Wyngaarden (2) has suggested several possible causes. These included: (*a*) the reevaluation of societal goals in the wake of the Vietnam conflict with an attendant swing away from biomedical research and toward medical care for underserved segments of the society, (*b*) medical school curriculum revisions that have re-

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duced the amount of research laboratory experiences available to students in the basic science years, (*c*) the perceived instability of federal funding for biomedical research and training in research, and (*d*) the lack of acceptance of research training as an appropriate portion of residency training by the specialty certifying boards. Additional reasons suggested by Wyngaarden (2) and others have included: (*a*) abolition of the physician draft, which has reduced the attractiveness of research training at government institutions, such as the NIH, where service fulfilled one's military obligation, (*b*) the relative financial attractiveness of a practice career as compared with a research career (4), and (*c*) the negative impact of the "payback provision" of the NRSAs (3).

The goal of this study was to assess the importance of some of these factors on decisions made by individuals to pursue research careers. The current paper is focused specifically on the clinical investigator with regard to: (*a*) the timing of his decision to enter research, (*b*) the relationship between the timing of the decision and research success, and (*c*) the effect of disincentives for entering a research career (the payback provisions and the military obligation).

Methods

To achieve the purposes of this study, the authors designed and mailed a questionnaire to "successful" clinical investigators in the spring of 1980. No attempt was made to identify a control group of "unsuccessful" clinical investigators, as the study was designed not to test the impact of an experimental program but rather to identify correlates of career decisions and success for clinical investigators. The survey population included 381 members of the American Society for Clinical Investigation (ASCI) who completed a similar questionnaire in 1975 (5), an additional 381 ASCI members who were age-matched to the original group to detect temporal change between 1975 and 1980, and a third group composed of 381 members of the American Federation for Clinical Research who were not members of the ASCI, age-matched to the original cohort. The questionnaire covered many topics ranging from job satisfaction to the amount of currently funded research (6). Based on comparative analyses, the three groups were not found to differ on the variables of interest for this paper. Therefore, the three subgroups were combined and treated as a single sample for purposes of this study.

Two questions were asked on the questionnaire regarding the timing of the career decision. The first was: "How old were you when you decided to enter research?" The second question asked whether a specific person or event clearly affected this decision. In response to this question, respondents were asked to provide details of the event or person. The responses to each of these questions provided different and important perspectives into the decision-making process. Combining the age at the time of the decision with data in other parts of the questionnaire, the temporal relationship between medical education and the respondent's decision was determined. Although a chronological outline of the respondent's medical education and training was requested, it was not possible to determine exactly the end of residency training and the beginning of fellowship training. Responses describing details of individuals or events affecting research career decisions were analyzed to determine the impact of mentors, powerful personal interactions, and events that affected the decisions.

To determine whether the timing of the decision was related to the ultimate success of the researcher, an arbitrary index of research success was developed based on data provided in the questionnaire. The index of research success was a weighted combination of three other variables: current research dollars awarded from all sources except pharmaceutical companies (60 percent), average number of research papers published per year over the past 10 years (30 percent), and the number of research trainees currently supported (10 percent). The values for each of these variables were standardized (by subtracting the mean and dividing by the standard deviation of each variable's distribution). The three scores (research dollars, publications, and trainees) were then combined into a single total score by multiplying each by its predetermined relative weight and summing the three component scores. The total scores were rank-ordered and assigned to nine groups (values one to nine), with level nine being the highest level of research success and level one the lowest. The resulting distribution of research success indices approximated a normal distribution. The ages given for a research career decision were then correlated with the scores on the research success index.

While the current disincentives to enter research careers were not present when the respondents made their decisions, they were queried regarding the possible effects of the currently imposed disincentives. Each respondent was asked, "Did your training meet your military obligation?" Respondents who answered "yes" were asked whether they would have done their research training had it not fulfilled this obligation. They were also asked to express their willingness to complete research training had a month-for-month payback been required.

Results

A total of 1,143 questionnaires were mailed, and 553 (48 percent) were returned in usable form. Of the 553, 37 were eliminated from this study because the respondent: (*a*) held a Ph.D. and not an M.D. degree or (*b*) was 65 years old or older and/or had retired. The analyses reported in this paper were conducted on the remaining sample of 516 respondents (45 percent).

Figure 1 presents the data relating career decisions to age. Twenty-one percent of the respondents had decided upon a research career before entering medical school. For 45 percent of the respondents, the decision to enter a research career was made during medical school. Residency and fellowship training accounted for the remaining 34 percent of the decisions.

Two-hundred seventy respondents identified a particular person who or event that most affected their decision to enter research. Of these, 151 described a person, 116 described an event, and three provided no detailed information. A careful analysis of these descriptions was used to determine exactly when they occurred. Figure 2 presents the frequency of decisions in each of four categories: before medical school, during medical school, during residency, and after the residency experience. A decrease in sample size ($n = 171$) was caused by respondents describing a person or event in such a way that the timing could not be ascertained. Based on this analysis, respondents were most influenced by specific events or people during medical school and following residency education. Forty percent of the descriptions were based on medical school experiences, and 35 percent described experiences following residency training. Most experiences described following the residency occurred during fellowship training. Only 14 percent of the described events occurred prior to medical school and 11 percent during residency.

The relationship between the timing of the decision and research success was determined by correlating the respondent's

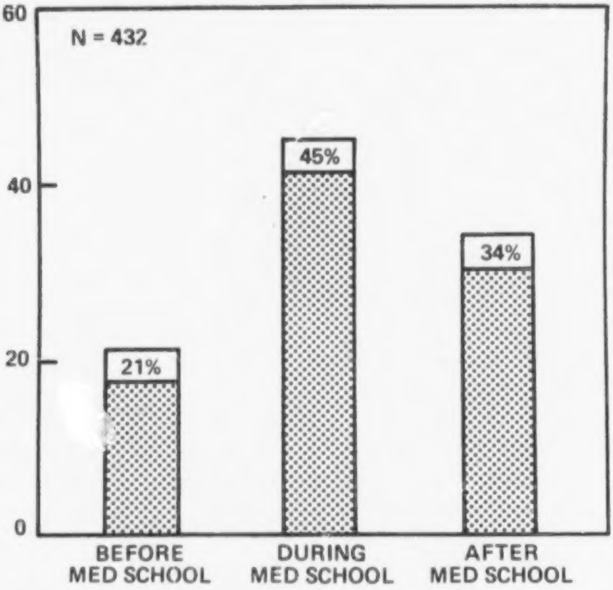

FIGURE 1

Percentage of clinical researchers responding to questionnaire who made career decisions before, during, and after medical school.

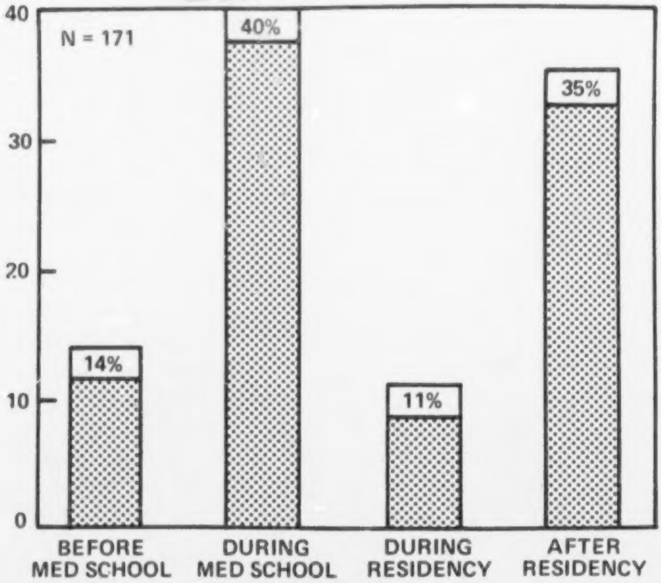

FIGURE 2

Percentage of responding clinical researchers whose career decisions were affected by a particular person or event.

age at the time of the decision with the score on the index of research success. The correlation coefficient (−.14; df = 365; p = .01), although small in magnitude, is statistically significant and indicated an inverse relationship between the time the decision was made and the research success of the investigator.

In response to the question on whether the training met a military obligation, 156 respondents (32 percent) indicated that it had, 328 (68 percent) indicated that it had not, and 32 did not answer the question. Of the individuals whose training had met their military obligation, 125 had done their training at the NIH, 20 in the armed forces, nine at the Center for Disease Control, and two in the U.S. Public Health Service. When the 156 respondents whose training fulfilled their military obligation were asked whether they would have done their training had it not fulfilled this obligation, 130 (85 percent) answered yes, 23 (15 percent) said no, and three did not answer the question. When the same 156 individuals were asked whether they would have done their research training if a month-for-month payback requirement had been required, 114 (78 percent) indicated they would have done the training anyway, 33 (22 percent) indicated they would not have done the training, and nine did not answer the question.

Discussion

This study illuminates several factors that have influenced decisions of successful clinical investigators to pursue a research career. Analysis of two discrete variables provided evidence that the decision to pursue a career in clinical investigation occurred most often during medical school. First, the largest fraction of respondents indicated that their research career decision was made during medical school. Secondly, the most important events which positively influenced this decision also occurred during the years in medical school. The large percentage of respondents (29 percent) who mentioned a specific person influential in their career choice also underscored the importance of research mentors during the medical school period. Finally, the observation that research success was related to the timing of the decision to enter a research career, that is, that earlier decisions were correlated with success, further underscored the importance of medical school experiences.

The finding that more decisions to enter research were made during medical school than at any other time is perhaps not surprising since the opportunities to view role models and be involved in research are limited prior to medical school and are restricted during the residency period when the emphasis is on patient care and not clinical research. Although selected residencies stress research, students may not select them unless an interest in research has been kindled during medical school.

It is recommended, based on the results of this study, that medical school curricula be carefully reexamined and modified in an effort to maximize the research opportunities for interested students. This recommendation is further underscored by the observed relationship between early decisions and greater research success. Emphasis should be placed on increasing laboratory and elective clinical research experiences. Totally new approaches appealing to medical students with research abilities should also be tested. Evaluation studies should be conducted to determine the impact of these curricular activities on the number of students choosing careers in clinical research.

Bickel and Morgan (7) reported a survey intended to identify research opportunities for medical students. They described three types of opportunities that should increase the attractiveness of research training for medical students. The first, referred to as "curricular opportunities," included research experiences primarily obtained in the basic science curriculum. Two factors have inhibited the growth and development of these opportunities: the inherent attraction clinical content has for the medical student and the increased emphasis on primary care with a reduced emphasis on research as a socially acceptable career choice. The second opportunity was labeled "extracurricular opportunities." This included research experiences during undergraduate and graduate medical education outside the school (for example, at NIH) and inside the school (for example, student research forums). The third category included the formal M.D.-Ph.D. programs.

Personnel needs in the clinical sciences as estimated by the National Research Council (NRC) call for "an annual increment of approximately 1,800 persons to meet requirements created by expansion and attrition of clinical faculties in medical schools over the next few years." (3) While 73 percent of the U.S. medical schools offer combined M.D.-Ph.D. programs and a selected subset have six-year medical scientist training programs (MSTP) funded by the National Institute for General Medical Sciences, these programs are not supplying the 1,800 potential clinical investigators needed according to the NRC. There are currently 24 MSTP programs, which support 120 new students each year. During the 1980–81 academic year, a total of 681 students were supported.*

It is remarkable that such disincentives as research training not fulfilling the military obligation and the requirement of a month-for-month payback were perceived to be relatively minor factors in the decision-making process. Since the questions were hypothetical to a group of well established investigators, the results are highly suspect. Nonetheless, it is possible that these seemingly large disincentives may be less important than previously thought. Studies should be conducted which determine the impact of these disincentives from the viewpoint of those directly affected.

The present study has utilized the opinions of members of two clinical research organizations. The respondents were nearly all members of faculties of departments of internal medicine throughout the United States. In this sense, the results may only apply to those factors influencing career decisions related to internal medicine. While there is no reason to believe that research career decisions are made in any different way in other disciplines, the results must be interpreted with this limitation. The 45 percent usable response rate represents a further limitation. Since the names were selected from membership lists and no additional information was available on nonrespondents, meaningful comparisons between respondents and nonrespondents were not possible. Therefore, it is possible that a response bias was present, the nature of which was indeterminate.

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Health Care Team Training In U.S. and Canadian Medical Schools

Cherry McPherson, Ed.D., and Larry A. Sachs, Ph.D.

Abstract—This paper reports the results of a survey to determine the extent to which interdisciplinary health team concepts are being taught as part of the undergraduate curriculum in U.S. and Canadian medical schools. Less than a third (29 percent) of the respondents indicated the existence of a formal program or program component designed to teach health care team skills. Although the total number of reported programs is small, 53 percent of these programs were required for all students. Three overall categories of content taught within the programs included group process skills, role and function of the team and its members, and content related to the health care context. Although the team approach is a process orientation, fewer than half of the programs reported using direct application of the process, that is, building groups of students into teams.

Three major factors have contributed to a reexamination of the health care delivery system that has resulted in an increased emphasis on the health team. First, medicine has begun to embrace the concept of caring for the total person, including attention to all factors that influence the individual's health status. Second, the U.S. government and private foundations have funded special projects to test and promote the team concept (1). The underlying rationales for these projects are primarily economic. As new health professions roles proliferate, ways of enabling each professional to function at his highest level of expertise theoretically would reduce overall health care costs. With physicians working as a team as opposed to individuals on a fee-for-service basis, total costs would also be reduced. Third, there is growing recognition that the nature of certain conditions, such as the multiple problems of geriatric, physically handicapped, or mentally retarded patients, requires the efforts of a committed team of professionals (2, 3). Although there has been wide recognition that the physician must be a fully functioning member if the health team is to operate effectively, there has been untested speculation that few medical schools participate in interdisciplinary programs to teach health team concepts.

The purpose of this study was to determine the extent to which interdisciplinary

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For related editorial, see page 340.

health team concepts are being taught in colleges of medicine throughout the United States and Canada. In those schools reporting the teaching of health team concepts, the study was further designed to identify what concepts, skills, and teaching strategies form the basis of the health team curriculum.

Methods

A letter and a questionnaire were mailed by the authors to the individual listed as the contact person for information about curriculum for each of the 141 U.S. and Canadian medical schools or colleges in the 1978-79 *AAMC Curriculum Directory* (4). The letter explained the purposes of the study and requested the individual's assistance.

The questionnaire consisted of two parts. In the first part, the respondent was asked to reply to the question: "Does your school have a formal program or program component that teaches the team approach in the delivery of health care as part of the undergraduate medical curriculum?" If the reply to this item was affirmative, the respondent was requested to answer the remaining items comprising the second part of the questionnaire.

The second part was designed to gather specific information regarding the identified health team programs. Major items were constructed to elicit information concerning the academic status of the program, administrative responsibility for the program, the number of participating students by profession, types of clinical facilities utilized, the content of the program, teaching techniques employed, and health professionals identified as part of the team. Each item included several subitems to allow respondents to list or select among specific options. Additionally, space was provided for respondents to list "other" categories not included within the item.

A review of the literature to determine characteristics of programs teaching health care team concepts was conducted prior to construction of the questionnaire. Items within the questionnaire were constructed to reflect characteristics of reported programs. The draft instrument was reviewed, edited, and revised by members of the project staff for the study.

The questionnaire was mailed to subjects in April 1980 with a four-week follow-up. Questionnaires were completed and returned by respondents from 105 (91 U.S. and 14 Canadian) of the 141 (74 percent) medical schools included in the survey. Eight of these were incomplete. In each of these cases, the respondent was contacted by telephone to supply the necessary information.

Results

Within the 105-member respondent group, 30 (27 U.S. and 3 Canadian) reported that the school included a formal program or program component that teaches the team approach in the delivery of health care as part of the undergraduate medical curriculum. Although the number of reported programs is small, the major findings of this survey generate a profile that merits consideration.

Most of the programs (73 percent) were the administrative responsibility of a single clinical department. Twelve (40 percent) were administered through departments of family and/or community medicine, while four (13 percent) were housed in departments of medicine. Ten of the programs were taught in the preclinical years only, 11 in the clinical years only, and nine in both preclinical and clinical years. While the total number of programs is small, 53 percent of these were required for all students. The number of students enrolled in a given program ranged from one to a total class size of 256. Most of the programs (20, or 67 percent) were headed by a physician. No other professional group was identified as being responsible for the program with a frequency greater than one.

Table 1 presents the frequency with which various professionals were identified as members of the team. A great majority of schools included the physician, nurse, and social worker as team members. Other professionals cited with high frequency were the physical therapist, psychologist, psychiatrist, and internist. Three categories were added by respondents to the original list: pharmacist, physician's assistant, and allied health worker.

TABLE 1

Proportion of 30 U.S. and Canadian Medical School Programs Identifying Various Professionals as Members of the Health Care Team

Professionals	Percent of Programs
Physician	100
Nurse	97
Social worker	93
Physical therapist	63
Psychiatrist	60
Internist	53
Psychologist	53
Mental health worker	43
Health aide, nurse aide	40
Team secretary	37
Dentist	33
Community/family health worker	33
Surgeon	30
Health advocate	23
School teacher	17
Pharmacist	13
Physician's assistant	7
Allied health worker	3

A summary of the content taught within health care team programs is presented in Table 2. Three overall categories of content can be identified: group process skills, roles and function of the team and its members, and content related to the health care context. Only the latter category arises out of the health sciences; the major components of team development derive from behavioral and management sciences.

The most widely used technique to teach health care team concepts and skills was the field or clinical experience (Table 3). Other widely used methods included lecture/discussion, small group discussion, and role-modeling. Although the team approach is a process orientation, fewer than

TABLE 2

Proportion of U.S. and Canadian Medical School Programs Teaching Specific Health Care Team Concepts and Skills

Concepts and Skills	Percent of Preclinical Programs ($n = 19$)	Percent of Clinical Programs ($n = 20$)
Family interactions	95	85
Issues in health care	95	75
Professional roles		
Traditional roles	89	80
Role expectations	68	75
Coping with changing roles	58	45
Group process skills		
Communication	89	85
Group problem-solving	68	90
Decision-making	63	85
Leadership	63	65
Goal-setting	58	75
Role negotiation	58	50
Conflict management	32	35
Function of the team	79	80
Concepts of primary care	79	75
Task orientation	47	60

TABLE 3

Proportion of U.S. and Canadian Medical School Health Care Team Programs Using Various Teaching Methods in Preclinical and Clinical Years

Teaching Methods	Percent of Preclinical Programs (n = 19)	Percent of Clinical Programs (n = 20)
Lecture	68	35
Lecture/discussion	84	70
Small group discussion	73	70
Seminar	58	50
Assigned projects	32	60
Field/clinical experience	79	95
Simulated clinical experience	32	25
Role models	53	65
Films, trigger films	37	30
Building groups of students into teams	42	50

half of the programs reported using direct application of the process: building groups of students into teams.

Discussion

Although not unexpected, the most significant finding of the survey was the apparent low level of activity in health care team training within undergraduate medical curricula. With less than a third (29 percent) of the respondents indicating the existence of a formal program or program component to teach health care team skills, the priority assigned to these concepts is unquestionably low.

Part of the reason for this lack of emphasis may be due to the connotations of the term "health care team." Demonstration projects initiated to model the health care team usually have departed from the curative approach to medicine emphasized in tertiary care centers and developed instead a preventive and maintenance approach to primary care. The fact that many of these early projects served lower socioeconomic groups may also have contributed to a narrow application of the term. Reports of health care team training almost invariably describe a situation in which health professionals have come together to develop a new means of delivering health care (5).

In the health care system, it is nearly always the case that two or more professionals are working interdependently to achieve a common goal in service of the patient. Therefore, it seems logical to conclude that the team approach is basic to the practice of medicine. What is new is not the team but rather the conscious application of behavioral science concepts to the functioning of the team. Within the health sciences, teaching these concepts in a deliberate and studied fashion to students is not common. One very plausible explanation is that these principles—group process skills, management principles, organization dynamics—have developed in disciplines external to the health sciences and were not part of the training programs of the majority of today's physician educators. To teach this content may require either additional training of interested physician educators or the identification of a qualified nonphysician as educator.

Results of the present study indicate that those clinical departments reporting activity in teaching team concepts were often the primary care departments. This can be partially explained by the role of the primary care physician in coordinating various services required for the health maintenance of his patients. Interprofessional coordination among health care providers is further emphasized in primary care departments because of the variety of professionals typically included as departmental faculty. Furthermore, the interprofessional staffing of primary care departments may also increase the likelihood of locating an interested and qualified individual to teach team development skills.

Results of the reported study show that the content taught as part of preclinical health care team training often emphasizes topics only indirectly related to team development skills. These topics—family interactions, issues in health care, concepts of primary care—reflect the milieu in which the team functions rather than the team as an integrated delivery system. The shift in emphasis to team development skills—such as goal setting, decision-making, group problem-solving—during the clinical years suggests that some programs do attempt to prepare students for the interpersonal dynamics required in an integrated approach to health care planning and management.

Learning how to plan and interact with other professionals in an interdependent fashion requires experiential, "hands-on" training as opposed to more traditional classroom learning. The high incidence of field or clinical experiences is encouraging if one assumes that students function as teams during these experiences. The relatively low proportion of programs reporting the building of student groups into teams appears, however, to contradict that assumption. It may be more reasonable to assume that since a significant number of programs are taught during the clinical years, the selection of the item "field/clinical experience" indicates participation in a clerkship as opposed to participation as a team member. If this is indeed the case, some concern over the teaching techniques utilized in team training programs should be expressed.

The U.S. Bureau of Health Professions has stipulated that students from at least three health professions must participate in interdisciplinary education as an eligibility requirement for schools to receive a curriculum development grant. Several of the respondents reporting team training in this study were recipients of these awards, specifically in the areas of geriatrics and nutrition. Recipients of previous awards have expressed concern that federal grant awards are only for a three-year period and that this is not time enough to create conditions leading to institutionalization of the program in question.

If the teaching of health care team concepts is to expand within medical school curricula, a better appreciation for the benefits of the approach must be developed. The ultimate aim of medical education is improved patient care. Team training serves as a means to achieve that aim: by developing improved skills in working with other health professionals, the physician will be able to provide improved patient care.

Conclusion

Although the development of formal programs to teach health care team concepts appears to be a low priority among U.S. and Canadian medical schools, several programs do exist. As the primary care movement expands, it is likely to expect an increased emphasis on interdependent work relationships among health professionals. This may in turn lead to an expansion of programs that teach health care team concepts. The programs that have been reported in this study provide information about content, teaching techniques, and program administration that can serve as guidelines for future programs.

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DATAGRAM

Major Academic Origins of Medical School Deans

According to records maintained by the Department of Institutional Development of the Association of American Medical Colleges, 370 individuals served as deans of U.S. medical schools at some time during the years 1960 through 1980. The department maintains a file on these individuals and holds biographic information on all except one of the persons. This information was examined to determine the nature and major sources of academic training received by deans.

The vast majority of the deans, 349 of the 369, held an M.D. degree or its foreign equivalent. Seventeen of these had also received a Ph.D. degree in addition to their M.D. degree. When the sources of their medical degrees were examined, 331 were found to be graduates of U.S. medical schools, 8 were graduates of Canadian schools, and 10 were graduates of foreign schools outside of Canada. Nineteen U.S. schools each granted M.D.s to more than five of the deans, and together these schools granted

TABLE 1

Academic Origins of U.S. Medical School Deans Serving Between 1960 and 1980 with an M.D. from a U.S. School

Medical Schools	Alumni Serving as Deans		All Alumni	
	No.	Percent of All Deans	No.*	Percentage Serving as Deans
Harvard	36	10.9	6,154	0.58
Cornell	15	4.5	3,304	0.45
University of Pennsylvania	14	4.2	5,943	0.24
Northwestern	13	3.9	5,874	0.22
University of Michigan	11	3.3	5,963	0.18
Johns Hopkins	10	3.0	3,581	0.28
Illinois	9	2.7	6,735	0.13
Minnesota-Minneapolis	9	2.7	5,181	0.17
Chicago (Pritzker)	8	2.4	1,987	0.40
Columbia	8	2.4	4,943	0.16
Rochester	8	2.4	2,114	0.38
Washington-St. Louis	8	2.4	3,893	0.21
Yale	8	2.4	2,446	0.33
Maryland	7	2.1	4,067	0.17
New York University	7	2.1	5,519	0.13
Case Western Reserve	6	1.8	3,040	0.20
Duke	6	1.8	2,349	0.26
Stanford	6	1.8	2,229	0.27
Vanderbilt	6	1.8	2,257	0.27
Subtotal	195	58.9	77,579	0.25
All others	136	41.1	178,903	0.08
Grand Total	331	100.0	256,482	0.13

* Number of living graduates as of December 31, 1967, based on data from *Medical School Alumni, 1967*, published by the American Medical Association (AMA) in 1968. The 1967 alumni figures were used as the best approximation of the average number of alumni living during the period of study. The AMA also has published alumni figures for 1973. The more recent figures were not used because they include a larger number of individuals who held an M.D. during only a portion of the period considered here and exclude M.D.s active in this period who died between 1967 and 1973.

M.D.s to 195 of the deans, or 58.9 percent of all deans with M.D.s from U.S. schools (Table 1).

Harvard had 36 deans among its alumni, the largest number from any one school. Cornell, the University of Pennsylvania, and Northwestern followed Harvard with 15, 14, and 13 deans respectively among their alumni.

To give an indication of the relative contribution by each school in terms of the size of its alumni, the number of living physician graduates from each school at the end of 1967 was studied. This number of alumni was used to estimate what fraction of each school's graduates served as dean during 1960–1980 (Table 1). This percentage figure must be interpreted cautiously in that the deans are from segments of the alumni that do not strictly match the alumni alive in 1967. For example, a number of the deans' fellow graduates living in 1960 were no longer alive in 1967, and many of the more recent graduates might not had advanced far enough in their careers to have served as dean by 1980. For these and other related reasons, the percentages in the final column of Table 1 should not be used as the exact proportion of graduates who may ever serve as dean. It also should be recognized that because Table 1 identifies only those schools that granted M.D.s to more than five deans, schools with five or fewer deans among a small number of graduates might have similar fractions of alumni serving as dean.

With these limitations in mind, the data presented in Table 1 reveal some major differences between the academic origins of M.D. deans and other M.D.s. While the 19 schools listed in Table 1 granted degrees to 58.9 percent of the deans, they granted degrees to only 30.2 percent of all graduates of U.S. medical schools. In comparison with alumni of other schools, alumni of these schools were about three times as likely to serve as dean. When the distribution of the fractions of alumni serving as dean is examined, five schools are found to have percentages markedly higher than the others. The medical schools at Harvard, Cornell, Chicago (Pritzker), Rochester, and Yale all had unusually large fractions of deans among their alumni. Together these five schools granted M.D.s to 75 deans while having 16,005 living graduates at the end of 1967. These figures indicate that the alumni of these five schools were more than four times as likely to have served as dean in comparison with alumni of all other schools.

The 20 deans who did not hold an M.D. had Ph.D.s from U.S. universities. While the University of Minnesota-Minneapolis and Yale both granted Ph.D.s to three of these deans, no other school granted more than two.

TERRY BRYLL, *Division of Operational Studies, and* LYNN SUKALO, *Department of Institutional Development, both of the Association of American Medical Colleges, Washington, D.C.*

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preclinical and clinical years. Although comparisons are tenuous because of differences in data bases, it appears that there may have been a stabilization in the number of hours offered in the preclinical years since Webster's 1966 compilation. Webster combined the first- and second-year hours and reported an average of 96 hours, whereas the current study suggests only 87 hours in that category.

Over half (54 percent) of the coordinators sent additional material, such as lecture calendars, syllabi, and program descriptions, as requested. The high rate of submission may reflect a need or interest in sharing what they have developed and learning from the work of other coordinators.

It is encouraging that regardless of sex or type of graduate education, the curriculum coordinators reported a growing acceptance of behavioral science education by both students and faculty. On the other hand, however, it appears that data reflect a stabilization of time commitment and only a limited relationship between the time devoted to coordinating the behavioral science curriculum and the number of hours in or acceptance of that curriculum.

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Sex Differences in Medical Specialty Preferences

George H. Zimny, Ph.D., and Becky R. Shelton

The need for further investigation of the ways in which men and women medical students differ has been heightened by the recent substantial increase in the number of women students and by the possibility that women students are different from those of earlier years. Thomae-Forgues and Tonesk (1) pointed out that the total enrollment of women grew from 9,661 in 1974–75 to 16,141 in 1979–80, a 67.1 percent increase. During the same period, they reported the enrollment of men increased from 43,893 in 1974–75 to 47,637 in 1979–80, an increase of only 8.5 percent. McGrath and Zimet (2) concluded from their data that "faculty in medical schools and in subsequent specialty training settings and potential patients can increasingly expect women physicians who view themselves, and their specialty interests, differently from women physicians of the past."

The purpose of the present study was to investigate differences between men and women medical students in their preferences for medical specialties and for factors involved in the practice of medicine. Unlike other studies, the data reported here cover measured rather than stated preferences.

Method

The data consist of 46 preference scores obtained by 380 third-year medical students who voluntarily completed the Medical Specialty Preference Inventory (MSPI) (3, 4) in order to obtain information to use in planning their medical careers. The students were from five medical schools and included 287 men and 93 women.

The students completed the MSPI by rating each of 199 items on a seven-point scale ranging from 1 (low) to 7 (high) to indicate how desirable it is for them in the practice of medicine. The ratings provide an overall preference score for each of six specialties and a preference score for each of 40 factors. Analysis of variance was used to test the significance of sex differences on each of the 46 scores.

Dr. Zimny is professor of psychology, Department of Psychiatry, and Ms. Shelton is a second-year medical student, St. Louis University School of Medicine.

TABLE 1

Means and Standard Deviations of Preferences of Women and Men Third-Year Medical Students at Five Medical Schools

Specialty/Factor	Women (*n* = 93)		Men (*n* = 287)	
	Mean	S.D.	Mean	S.D.
Specialties*				
Medicine	65.44	6.98	68.20‡	7.70
Obstetrics-gynecology	67.86	6.50	65.69‡	7.18
Pediatrics	67.27	6.13	65.18‡	7.30
Psychiatry	54.92	7.95	52.80†	8.26
Surgery	63.06	8.83	66.28‡	8.99
Family medicine	65.24	9.69	67.10	10.77
Medical Practice Factors*				
Many major diseases	4.80	0.99	4.99	1.02
Infectious diseases	4.50	1.34	4.72	1.27
Incurable and disabling diseases	2.80	1.13	3.19‡	1.17
Neural functions	3.66	1.24	4.18‡	1.24
Reproductive functions	4.00	1.49	3.99	1.33
Complex problems	4.59	1.25	4.85†	1.14
Life-threatening problems	4.00	1.58	4.64‡	1.33
Psychosomatic problems	3.73	1.30	3.85	1.40
Intimate personal problems	4.14	1.50	4.27	1.55
Emotional reactions to illness	3.96	1.32	3.90	1.36
Older age patients	3.35	1.23	3.64	1.29
Child and adolescent patients	4.90	1.53	4.75	1.36
Dying patients	3.35	1.19	3.72‡	1.29
Many patients daily	4.02	1.19	3.97	1.21
Comprehensive care	4.72	1.23	4.67	1.37
Home health care	3.86	1.54	4.15	1.31
Preventive care	5.32	1.46	4.95†	1.35
Genetic counseling	3.76	1.58	3.49	1.29
Marital and sexual counseling	4.14	1.59	4.01	1.58
Family planning counseling	4.19	1.60	3.91	1.45
Discussion of personal relations	3.40	1.41	3.57	1.40
Patient participation	5.30	1.10	5.03†	1.07
Beneficial treatment results	5.39	0.99	5.48	0.96
Knowledge of skeletal and muscular systems	3.62	1.55	4.21‡	1.42
Knowledge of circulatory, respiratory, digestive, and excretory systems	4.12	1.23	4.64‡	1.16
Knowledge of anatomy and physiology	4.69	1.13	5.15‡	1.03
Extensive precise work-ups	4.84	0.84	4.94	0.84
Laboratory tests	5.02	0.94	5.28†	0.97
Proctoscopies and arteriograms	3.29	1.26	4.24‡	1.28
Complex equipment	3.45	1.35	4.14‡	1.48
Use of hands	5.40	1.21	5.56	1.09
Standard procedures	4.27	1.04	4.50	1.10
High risk procedures	2.81	1.16	3.36‡	1.37
Outpatient operative procedures	4.57	1.60	4.85	1.53
Family information	4.52	1.19	4.41	1.20
Socioeconomic information	4.04	1.18	4.08	1.25
Rehabilitation services	3.83	1.25	4.25‡	1.29
Social services	4.06	1.40	4.23	1.38
Psychological services	3.34	1.35	3.68†	1.51
Referrals and consultations	4.81	1.32	5.05	1.13

* Ranges of scores were 0 to 100 for specialties and 1.0 to 7.0 for medical practice factors. † $p = .05$. ‡ $p = .01$.

Results

Table 1 contains the mean and standard deviation of the 46 scores for the men and women students and the results of the tests of significance of differences. Men students had a significantly higher preference for internal medicine and surgery and women students for obstetrics-gynecology, pediatrics, and psychiatry. Men showed a significantly higher preference for 14 factors and women for 2 factors. Fifteen of these 16 factors appear to fall into five fairly distinct groups.

Among the factors on which the men scored significantly higher, one group consists of incurable and disabling diseases, life-threatening problems, complex problems, dying patients, and high risk procedures. This indicates that the men had a greater preference than the women for dealing with serious complex medical problems. A second group consists of three knowledge factors, indicating a greater preference by the men for the knowledge base employed in medicine. The third group of factors consists of laboratory tests, proctoscopies and arteriograms, and complex equipment. This suggests a greater preference by the men for complex technical procedures used in the practice of medicine. The last group contains the factors of rehabilitation services and psychological services, suggesting a greater preference by the men for these ancillary services; this preference may, in turn, be related to their greater preference for dealing with disabled and dying patients.

The two factors on which the women scored significantly higher were preventive care and patient participation. These factors as a group suggest a greater preference on the part of the women for giving patients responsibility for their own health care.

Discussion

The sex differences in preferences for medical specialties found here using measured preferences are similar in most respects to the results of other studies (2, 5) that used different ways of assessing preference or choice. The levels of preference for psychiatry by men and women, although significantly different, were very low in comparison with those for all other specialties. This finding holds little promise for resolution of the manpower problem in psychiatry (6).

The first three groups of factors for which the men showed a higher preference than the women, namely, serious complex problems, knowledge, and technical procedures, appear to underlie the men students' greater preference for internal medicine and surgery. The women students' greater preference for giving responsibility to patients could be considered as at least one basis for the women's greater preference for obstetrics-gynecology (woman's care of herself and her fetus), pediatrics (parents' care of their children), and psychiatry (patients' necessary involvement in solving their problems).

The groups of factors showing sex differences also have implications for the ways in which men and women may function during their residency training and in their practice, regardless of which specialty they enter. Men may be expected to be more cognitively and technically oriented and women more patient oriented. These are only general expectations because of individual differences in preferences among the men and among the women, but the expectations do promise diversity among physicians. Whether these expectations are borne out under the rigors of residency training and of practice is a question that warrants investigation.

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DATAGRAM

Results of the NRMP for 1982

The number of U.S. graduates (USG) who enrolled in the National Resident Matching Program (NRMP) in 1982 was 292 more than in 1981 (1). The percentage of the class who enrolled increased by two percentage points, and the number who subsequently withdrew decreased by 1 percentage point (Table 1). The proportion who were unmatched increased from 7.2 to 7.9 percent. Among the North American graduates (NAG), the number of "fifth pathway" applicants increased from 456 to 528; 430 participated in the match, and 75 percent were successful, compared with 76 percent of the Canadian graduates, 64 percent of the osteopathic graduates, and 61 percent of physician applicants.

TABLE 1

Participation in the National Resident Matching Program in 1982

Category	U.S. Students		North American Graduates*		Foreign Graduates		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Applicants	15,788	100	1,486	100	4,852	100	22,126	100
Withdrew	1,644	10	555	37	1,517	31	3,716	17
Active participants	14,144	90	931	63	3,335	69	18,410	83
Matched	13,023	92	639	69	1,287	39	14,949	81
Unmatched	1,121	8	292	31	2,048	61	3,461	19
Total	14,144	100	931	100	3,335	100	18,410	100

* North American graduates include graduating students from U.S. osteopathic schools; Canadian medical schools; physician candidates, that is, U.S. graduates who did not enter GME directly from medical school, and "fifth pathway" students, who are U.S. nationals who completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship.

The number of graduates of foreign medical schools (FMG) who applied increased by 2,336. Of the 4,852 who applied, 1,348 were U.S. citizens; the number of U.S. FMG increased by 72 percentage points, and the number of alien FMG doubled. The percentage of all FMG who matched decreased by 13 percentage points; 57 percent of U.S. FMG were matched, but only 31 percent of alien FMG obtained a position.

The total number of U.S. citizens (U.S. students, "fifth pathway," and U.S. FMG) who applied to the match this year increased by 6 percent.

The number of positions offered for the first postgraduate year decreased by 31; 127 more were offered in the generalist* specialties than in 1981 (Table 2). The ratio of positions per applicant was 0.8; that of positions per U.S. citizen applicant was 1.04, and that of positions per U.S. medical school graduate was 1.16; the ratios for active applicants in the match were, respectively, 0.99, 1.18, and 1.29.

The overall filling of positions increased by 5 percentage points; the filling of positions by U.S. graduates increased by 2 percentage points, and the filling by other applicants increased by 2 percentage points. The most competitive programs were in obstetrics, neurosurgery, orthopedic surgery, and otolaryngology; in all of these, over 90 percent of the positions were filled.

Only 30 more USG entered family practice programs than in 1981, but the filling of total positions increased by 4 percentage points be-

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* "Generalist" specialties are defined as family practice, internal medicine, obstetrics, and pediatrics.

TABLE 2

Positions Offered and Filled by Specialty and Type of Applicants in the NRMP in 1982

Specialties	Positions Offered		Applicants Matched												
			U.S. Students			North American Graduates‡			Foreign Graduates			Total		
	No.	Percent*	No.	Percent		No.	Percent		No.	Percent		No.	Percent	
				*	†		*	†		*	†		*	†
Family practice	2,362	13	1,757	13	74	74	12	3	109	8	5	1,940	13	82
Internal medicine	6,260	34	4,484	34	72	239	37	4	525	41	8	5,248	35	84
Pediatrics	1,810	10	1,203	9	66	56	9	3	216	17	12	1,475	10	81
Obstetrics	1,035	6	841	6	81	75	12	7	46	4	4	962	6	93
Psychiatry	922	5	541	4	59	17	3	2	45	3	5	603	4	65
Medical specialties	109	1	50	0	46	0	0	0	5	0	5	55	0	50
Dermatology	9		6		67	0		0	0		0	6		67
Neurology	72		30		42	0		0	5		7	35		49
Ophthalmology	28		14		50	0		0	0		0	14		50
General surgery	2,340	13	1,777	14	76	95	15	4	173	13	7	2,045	14	87
Surgical specialties	553	3	490	4	89	21	3	4	7	1	1	518	3	94
Neurosurgery	40		37		93	0		0	1		3	38		95
Orthopedics	305		287		94	14		5	1		0	302		99
Otolaryngology	96		87		91	3		3	0		0	90		94
Urology	107		75		70	4		4	5		5	84		79
Plastic surgery	5		4		80	0		0			0	4		80
Support specialties	1,566	9	881	7	56	30	5	2	83	6	5	994	7	63
Anesthesiology	507		343		68	12		2	28		6	383		76
Pathology	557		236		42	6		1	36		6	278		50
Physical medicine	92		36		39	2		2	3		3	41		45
Diagnostic radiology	336		251		75	10		3	10		3	271		81
Therapeutic radiology	72		15		21	0		0	6		8	21		29
Nuclear medicine	2		0		0	0		0			0	0		0
Flexible	1,343	7	999	8	74	32	5	2	78	6	6	1,109	7	83
Total	18,300	100	13,023	100	71	639	100	3	1,287	100	7	14,949	100	82

* Percent distributions of positions offered and filled among specialties (percentages may not add because of rounding).

† Percent filling of positions.

‡ See Table 1 footnote.

cause of the number of non-USG who matched. Internal medicine attracted 157 more USG than last year, and the filling of total positions increased by 5 percentage points despite the offering of 131 more positions, also because of the number of non-USG who matched.

In pediatrics, general surgery, flexible programs, and the support specialties, the numbers of positions offered decreased; and, with the exception of general surgery and anesthesiology, the numbers of USG who entered them also decreased. An increase of 11 percentage points of USG entering psychiatry occurred, thus continuing the increase that occurred last year.

The participation of programs and positions in the surgical specialties of orthopedic surgery, otolaryngology, and urology increased by one-third, and over 90 percent of the positions were filled by USG. A few programs in nuclear medicine and plastic surgery participated in the match for the first time.

The distribution of matched USG among types of programs increased somewhat in internal medicine, psychiatry, the surgical specialties, and anesthesiology and decreased slightly in pediatrics, flexible programs, and the other support specialties.

In the 1982 match, 72 programs offered an additional 170 positions as advanced student programs to be entered in July 1983 or 1984. Only 35 applicants matched to these positions; in the same match, 25 also matched to a first postgraduate year. Finally, 54 programs offered 124 positions to residents rather than students as advanced resident programs; none was filled.

Data that describe the trends in numbers of positions offered and filled by U.S. graduates and other applicants during the past several years are included in the 1982 *NRMP Directory* (2).

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1981-82 Enrollment in U.S. Medical Schools (Datagram)

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Family Practice as a Specialty Choice: Effect of Premedical and Medical Education

William D. Brearley, M.D., William Simpson, M.D., and Richard M. Baker, M.D.

Abstract—Identification of beneficial and detrimental parameters influencing the choice of family practice as a career was the object of the study reported here. Curriculum components and elements during or before medical school were examined. A questionnaire listing 18 factors that influenced specialty choice before residency training was completed by 134 first-year family practice residents. Participation in a family practice clerkship or preceptorship during the third and fourth years of medical school and association with family physicians during or before medical school were perceived as most beneficial. Generally, students' experiences during the first three years were perceived as detrimental to selecting family practice. Also, data indicated that 75 percent of the students select their specialty during years three and four. Medical schools wishing to increase the number of their graduates entering family practice should strongly consider requiring clinical rotations in family medicine and providing maximum exposure to family practice residents and faculty members as role models.

Medical specialty choice is a multifaceted, complex personal decision that has commanded great interest in medical education research in recent years. As the trend toward medical specialization accelerates, this area of interest becomes even more important (1). Previous studies relate medical student specialty preferences to personality characteristics, age, value systems, intellectual capabilities, and personal backgrounds. Another important aspect of specialty choice is the role of medical education in the decision-making process. This issue is addressed by the present paper, with the specialty of family practice as the focus.

The undergraduate medical curriculum is not a constant; it is, rather, a constantly evolving phenomenon. The problem of the distribution of physicians, in both a specialty and geographic sense, is being addressed by recent trends toward increasing the use of electives in medical school and toward more community orientation and primary care education (2). While the specialty distribution of physicians cannot be addressed solely by curricular changes, the curriculum may have some effect on the problem. The optimal curriculum would allow each student the greatest opportunity to develop his own interests and ability, whether in the area of primary care or the medical or surgical subspecialties.

Donovan and colleagues (3) found that

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39 percent of medical students maintained a consistent career choice, while 61 percent reported a major change in career preference between their sophomore and senior years. There appeared to be no differences in motivational, personality, or cognitive differences between the consistent and inconsistent groups. Held and Zimet (4) found that the certainty level of specialty choice among medical students increased dramatically with respect to level of training. They reported that 75 percent of medical students changed their choice between their first and fourth years. Although in the latter study a high initial certainty level correlated with a high percentage of students choosing family practice, student statements of specialty choice early in medical careers were generally unreliable predictors of their ultimate decision.

As the specialty of family practice has grown in popularity, so have the studies of the students choosing it (5–7). There appear to be significant personality and value differences among students entering respective specialties (8). Zimet and Held (9) found that student concepts of family practice changed little with various classes; it was held highest in "social attractiveness" though lowest in "status" throughout the four years. Moreover, the family practitioner was seen as a role model by all students, regardless of their own specialty choice. Students also rated themselves as having traits similar to those they attributed to family physicians, again regardless of their own specialty choice. Paiva and Haley (10) reported that students interested in family practice tended to come from small towns or rural areas, tended to have Protestant religious backgrounds with more emphasis on religious values than other students, were less exposed to medicine prior to medical school, and scored highest with respect to belief in the strength of patients' inner resources. Intellectually, their scores on the Medical College Admission Test (MCAT) were generally average. It has also been reported that most students who eventually go into family practice do not decide on attending medical school until late in the educational process, that is, during or after their undergraduate education (11). Family practice was also the only specialty in which men and women choosing it appeared to be quite similar in personality traits (12). As a general trend, these students planned to spend little time in teaching and research, and most planned to practice in relatively small communities (13).

The study on which this article is based examined the role of the curriculum in the subset of medical students who eventually chose family practice residencies in order to delineate which aspects of the educational process fostered or discouraged their interests in primary care. Such information could be beneficial to curriculum planners in answering the demand for primary care physicians (11).

Materials and Methods

The authors mailed a three-page questionnaire to first-year family practice residents in community hospital-based, military, and university medical center-based programs. The survey covered 19 residency programs, mostly in the southeast. A total of 134 residents responded for a response rate of 82 percent. The respondents represented a total of 64 medical schools in 32 states and Puerto Rico, and they equaled 5 percent of all first-year residents in family practice residencies in the United States during the 1980–81 academic year.

In addition to questions about demographic data and timing of decision to choose family medicine as specialty choice, the residents were asked to evaluate 18 factors that might have influenced their decision on specialty choice during predoctoral medical education. A five-point scale was used, enabling the resident to evaluate each factor from "definitely beneficial" to "definitely detrimental." Alternatively, the residents could indicate that the item did not apply, for example, if they did not elect or did not have available a preceptorship in the first or second year. The wording of the question was as follows: "How did the following parameters affect your choice of family practice as a medical specialty?"

Results

Demographic data revealed that 95 percent of the respondents were physicians, and 5 percent were osteopaths. There were 83 percent males and 17 percent females; 68 percent were married, while 28 percent were single, and three percent were divorced. The majority of the first-year residents, 59 percent, were 26 or 27 years old, and 52 percent were from hometowns with populations of less than 25,000.

The timing of the first-year residents' decision to enter the specialty of family practice in regard to the educational process was significant (Table 1). Fifty-eight percent stated that they had considered family medicine prior to medical school, and, indeed, almost half of that group had considered a career in family medicine prior to college. The decision definitely to enter this specialty was reserved until later in medical school; 75 percent made that commitment during the clinical years (40 percent in the third year and 34 percent in the fourth year), while only 11 percent stated that they had made a definite commitment during the preclinical years.

From the "beneficial" parameters in Table 2, it can be seen that exposure to family practice in the clinical years is most important, since preceptorships in the third and fourth years and the clerkship in family practice ranked first and second, respectively. In addition, association with family practice physicians is also important, as evidenced by three of the top seven being contact with family practice residents, hometown family doctor, and family practice faculty.

TABLE 1

Percentage of 134 First-Year Residents in Family Practice Reporting Preliminary and Definitive Career Decisions at Various Educational Phases Prior to Graduate Training

Educational Phases	Percent
First Consideration	
Before college	28.0
During college	29.5
Year 1 medical school	18.9
Year 2 medical school	6.1
Year 3 medical school	7.6
Year 4 medical school	7.6
Other	2.3
Definite Decision	
Prior to medical school	12.8
Year 1 medical school	7.5
Year 2 medical school	3.0
Year 3 medical school	40.6
Year 4 medical school	34.6
Other	1.5

Table 3 lists the rank order of parameters judged by respondents to be "detrimental." The percentages are adjusted to exclude those residents who marked "does not apply," since they likely meant that they had not had the opportunity to experience such things as a clerkship, preceptorship, and family practice club. This assumption is supported by the small numbers (less than 10 percent) marking "does not apply" for items all students experience (year 2 curriculum, for example), while the item, "clerkship in family practice," had 28 percent "does not apply."

Discussion

Positive influences on career choice for family practice proved to be those occasions in which the student could experience family practice and observe family physicians. The contact with family practice residents and faculty cannot be overemphasized. Also, the value of preceptorships in all years is striking. Preceptorships in the first two years did appear in the top

TABLE 2

Rank-Ordered Listing of Questionnaire Items According to the Percentage of First-Year Residents in Family Practice Rating Them as 'Beneficial Parameters' in Reaching a Career Decision

Rank	Parameter	Definitely Beneficial	Slightly Beneficial	Total
1	Preceptorship with a family physician during years 3 and 4	55	33	88
2	Clerkship in family medicine	44	37	81
3	Hometown family doctor	41	38	79
4	Contact with family practice residents	37	39	76
5	Preceptorship with a family physician during years 1 and 2	57	17	74
6	Year 4 curriculum	26	46	72
7	Contact with family practice faculty	33	33	66
8	Hometown	25	35	60
9	Year 3 curriculum	19	36	55
10	American Academy of Family Physicians membership	9	36	45
11	Religion	13	30	43
12	Parents	14	28	42
13	Spouse and children	2	33	35
14	Premedical education	8	26	34
15	Family practice club meetings	12	22	34
16	Peer group attitudes	4	30	34
17	Year 2 curriculum	5	23	28
18	Year 1 curriculum	4	23	27

TABLE 3

Rank-Ordered Listing of Questionnaire Items According to the Percentage of First-Year Residents in Family Practice Rating Them as 'Detrimental Parameters' in Reaching a Career Decision

Rank	Parameter	Definitely Detrimental	Slightly Detrimental	Total
1	Peer group attitudes	25	5	30
2	Year 2 curriculum	15	11	26
3	Year 1 curriculum	11	11	22
4	Year 3 curriculum	14	7	21
5	Contact with family practice faculty	8	3	11
6	Premedical education	7	3	10
7	Year 4 curriculum	7	3	10
8	Spouse and children	9	—	9
9	Parents	8	—	8
10	Hometown family doctor	4	2	6
11	Family practice club meetings	6	—	6
12	Hometown	5	1	6
13	Preceptorship with a family physician during years 1 and 2	4	—	4
14	Preceptorship with a family physician during years 3 and 4	4	—	4
15	Contact with family practice residents	3	1	4
16	American Academy of Family Physicians membership	3	—	3
17	Religion	3	—	3
18	Clerkship in family medicine	1	—	1

five parameters, even though a review of the data shows that 80 of the 134 respondents marked "does not apply" for that question. That meant that either the elective was not available or they did not take it. Of the 54 who did respond to the question, 57 percent said it was definitely beneficial. These findings are consistent with those of a study by the American Academy of Family Physicians, which showed a direct relationship between family practice as specialty preference and a preceptorship experience (14).

Negative influences on career choice for family practice were found to be: peer group attitudes and the traditional curriculum of predoctoral medical education. The "detrimental" influence of the medical school curriculum can be seen in Table 3. Three of the four most negatively evaluated parameters were the first three years of medical school curriculum. Since most residents surveyed attended "traditional" medical schools, they were reporting influences in the preclinical years and the third year (clerkships) as being opposed to their interest in family practice careers.

The timing of the students' decision definitely to enter family practice should encourage a family medicine curriculum during the first three years. The vast majority, 75 percent, made such a commitment during the third and fourth years of medical school, while a small minority, 13 percent, had made such a decision prior to entering medical school. In the latter group, the single greatest positive influence was the hometown family physician. Even more striking, of the 51 percent of students from hometowns with populations of less than 25,000, 71 percent stated that the single most positive influence was again the hometown family physician. This finding is substantiated by Oates, who also reports the significance of hometown size on specialty choice (15). Of those who made their specialty choice in the clinical years, preceptorships proved to be most valuable. The value of a family medicine preceptorship in clarifying career choice is also reported by Friedman and colleagues (16).

Implications

The implications of this study are important to all family physicians, whether in an academic environment or in private practice or in both. A major implication is that family physicians should never underestimate themselves as role models both for students interested in family practice and for all students who are interested in medicine. The potential for being a powerful influence is certainly present, and such opportunities should be taken seriously.

It appears that exposure to the principles and practice of family medicine in informal settings was more influential in career choice than formal "course work." Therefore, these contacts should be encouraged and expanded if medical students are to develop an interest in family medicine. Existing formal family medicine contacts should be restructured to allow more contact with individual family practice residents and faculty members. Required clinical rotations in family medicine during the third year or very early in the fourth year should be strongly considered for all medical schools wishing to increase the number of their students who enter family medicine.

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DATAGRAM

1981–82 Enrollment in U.S. Medical Schools

Total enrollment in the nation's medical schools continued to rise in 1981–82 but at a slower pace than in previous years. The total enrollment of 66,298, although the greatest absolute number of enrolled students to date, represented only a 1.7 percent proportional increase from the previous year. The corresponding proportional increases for 1980–81 and 1979–80 were 2.2 percent (65,189 enrolled) and 2.5 percent (63,800 enrolled) respectively. The growth in 1981–82 depicts the smallest change in six years of successively diminishing proportional increases in total enrollment. The stabilization of class sizes at established U.S. medical schools and the lack of new school openings since 1979 have contributed to the leveling off of enrollment totals.

In the fall of 1981, medical schools were asked for the first time to report new entrants to the first year as a distinct group in the annual Fall Enrollment Survey of the Association of American Medical Colleges (AAMC). The reported total of 16,644 new entrants differs from first-year enrollees (17,268), since it is restricted to those students entering medical school for the first time. Total first-year enrollment figures include first-year new entrants and students repeating or reentering the initial year of medical school. In addition, students continuing the first year as participants in special programs are included in this category. The increased flexibility of some medical school curricula permits students to extend the customary first-year program beyond a single year.

Trends in the size and make-up of first-year new entrants cannot be analyzed since comparable data from previous years are not available. However, data on new entrants will continue to be collected annually, thereby allowing for future trend studies.

Although the size of both first-year and total medical school enrollments has demonstrated little change, the composition of the medical student population has shifted noticeably. Over the past four years, the proportion of women studying medicine has shown consistent increases of about 7 percent each year. In 1981–82, a total of 18,505 women medical students were enrolled compared with 17,248 in 1980–81. Overall, women held 27.9 percent of the places in the nation's medical schools in 1981–82 in contrast to 23.7 percent four years earlier. The percentage of women enrolled in the 1981–82 first-year class approached the one-third mark at 30.8 percent (5,317 women) in contrast to 28.9 percent (4,966 women) in 1980–81 and 25.6 percent (4,130 women) in 1977–78.

The total number of underrepresented minorities enrolled in the 126 medical schools in 1981–82 was 5,503, or 8.3 percent of the total enrollment. There were 1,422 underrepresented minority medical students in the entering class, representing 8.6 percent of all new entrants in the 1981–82 academic year.

In the 1981–82 administration of the enrollment survey, the instructions were changed to include students holding permanent resident visas with U.S. citizens. This change in classification aligned the AAMC's approach with the designation used by the majority of the schools. Previously, these individuals were recorded as foreign students. As a result of the reclassification, the number of foreign students reported for 1981–82 exhibited a sizable decrease; those with permanent resident visas were distributed among the racial/ethnic breakdowns of the U.S. citizen category. This fact and the possibility of independent changes in the sizes of the various U.S. citizen subgroups confound any strict comparison of the information for underrepresented minorities and other racial/ethnic groups between the current and previous years. This is especially true where the magnitude of change in 1981–82 is relatively small. Only in the case of the Asian or Pacific Islander category does the increase appear large enough to suggest that it was elevated appreciably by the inclusion of students holding permanent resident visas. Changes in other relevant categories are quite small and make inferences concerning important shifts in the prevailing trends inadvisable.

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TABLE 1

U.S. Medical School Enrollment for 1981–82

Racial/Ethnic Group	First-Year New Entrants				First-Year Enrollment*				Total Enrollment			
	Men	Women	Total	Percent of Total	Men	Women	Total	Percent of Total	Men	Women	Total	Percent of Total
U.S. Citizens†												
White	9,760	4,135	13,895	83.5	9,991	4,227	14,218	82.4	41,308	14,893	56,201	84.8
Underrepresented Minorities												
Black	554	430	984	5.9	679	517	1,196	6.9	2,166	1,718	3,884	5.9
American Indian or Alaskan Native	46	18	64	0.4	51	19	70	0.4	166	63	229	0.3
Mexican American/Chicano	194	83	277	1.7	209	91	300	1.8	747	293	1,040	1.6
Puerto Rican (mainland)	56	41	97	0.6	59	46	105	0.6	211	139	350	0.5
Subtotal	850	572	1,422	8.6	998	673	1,671	9.7	3,290	2,213	5,503	8.3
Other U.S. Groups												
Asian or Pacific Islander	493	254	747	4.5	508	257	765	4.4	1,731	787	2,518	3.8
Puerto Rican (Commonwealth)	169	72	241	1.4	176	74	250	1.5	569	287	856	1.3
Other Hispanic	174	58	232	1.4	185	62	247	1.4	612	235	847	1.3
Subtotal	836	384	1,220	7.3	869	393	1,262	7.3	2,912	1,309	4,221	6.4
Foreign Students												
Black	11	5	16	0.1	15	7	22	0.1	54	26	80	0.1
Other	72	13	85	0.5	75	14	89	0.5	226	60	286	0.4
Subtotal	83	18	101	0.6	90	21	111	0.6	280	86	366	0.5
Unidentified	3	3	6	‡	3	3	6	‡	3	4	7	‡
Grand Total§	11,532	5,112	16,644	100.0	11,951	5,317	17,268	100.0	47,793	18,505	66,298	100.0

Source: 1981–82 AAMC Fall Enrollment Survey. Reflects enrollments as of October 16, 1981, at all 126 schools.

* First-year enrollment includes new entrants and those repeating, reentering, or continuing the initial year.

† Foreign students with permanent resident visas are included with U.S. citizens.

‡ Less than 0.1 percent.

§ The percentage of women enrolled in 1981–82 as first-year new entrants, first-year enrollees, and total enrollees were 30.7, 30.8, and 27.9 respectively.

TABLE 2

First-Year U.S. Medical School Enrollment, Men and Women*

Sex	1977–78 (120 Schools)		1978–79 (124 Schools)		1979–80 (126 Schools)		1980–81 (126 Schools)		1981–82 (126 Schools)	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Men	12,006	74.4	12,339	74.8	12,217	72.2	12,220	71.1	11,951	69.2
Women	4,130	25.6	4,162	25.2	4,713	27.8	4,966	28.9	5,317	30.8
Total	16,136	100.0	16,501	100.0	16,930	100.0	17,186	100.0	17,268	100.0

* First-year enrollment includes new entrants and those students repeating, reentering, or continuing the initial year.

TABLE 3

First-Year U.S. Medical School Enrollment by Racial/Ethnic Group and Citizenship*

Racial/Ethnic Group	1977–78		1978–79		1979–80		1980–81		1981–82†	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
U.S. Citizens										
White	13,732	85.1	14,048	85.1	14,259	84.2	14,262	83.0	14,218	82.4
Underrepresented Minorities										
Black	1,085	6.7	1,061	6.4	1,108	6.5	1,128	6.6	1,196	6.9
American Indian or Alaskan Native	51	0.3	47	0.3	63	0.4	67	0.4	70	0.4
Mexican American/Chicano	246	1.6	260	1.6	290	1.7	258	1.5	300	1.8
Puerto Rican (mainland)	68	0.4	75	0.5	86	0.5	95	0.5	105	0.6
Subtotal	1,450	9.0	1,443	8.8	1,547	9.1	1,548	9.0	1,671	9.7
Other U.S. Groups										
Asian or Pacific Islander	395	2.4	452	2.7	502	3.0	572	3.3	765	4.4
Puerto Rican (Commonwealth)	144	0.9	179	1.1	226	1.3	241	1.4	250	1.5
Other Hispanic	157	1.0	151	0.9	188	1.1	224	1.3	247	1.4
Subtotal	696	4.3	782	4.7	916	5.4	1,037	6.0	1,262	7.3
Foreign Students	258	1.6	228	1.4	208	1.3	339	2.0	111	0.6
Unidentified	—	—	—	—	—	—	—	—	6	‡
Grand Total	16,136	100.0	16,501	100.0	16,930	100.0	17,186	100.0	17,268	100.0

* First-year enrollment includes new entrants and those students repeating, reentering, or continuing the initial year.

† In 1981–82, the definition of U.S. citizens was expanded to include students holding permanent resident visas. These individuals were previously recorded as foreign students. This reclassification means that the U.S. citizen categories absorbed the decrease noted in the foreign subtotal between 1980–81 and 1981–82.

‡ *Less than 0.1 percent.*

TABLE 4

Total U.S. Medical School Enrollment, Men and Women

Sex	1977–78 (120 Schools)		1978–79 (124 Schools)		1979–80 (126 Schools)		1980–81 (126 Schools)		1981–82 (127 Schools)	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Men	45,821	76.3	47,111	75.7	47,651	74.7	47,886	73.5	47,793	72.1
Women	14,218	23.7	15,102	24.3	16,149	25.3	17,248	26.5	18,505	27.9
Total	60,039	100.0	62,213	100.0	63,800	100.0	65,189*	100.0	66,298	100.0

* Total includes 55 students from whom gender was not reported.

TABLE 5

Total U.S. Medical School Enrollment by Racial/Ethnic Group and Citizenship

Racial/Ethnic Group	1977–78		1978–79		1979–80		1980–81		1981–82*	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
U.S. Citizens										
White	51,974	86.6	53,720	86.4	54,854	86.0	55,434	85.0	56,201	84.8
Underrepresented Minorities										
Black	3,587	6.0	3,537	5.7	3,627	5.8	3,708	5.7	3,884	5.9
American Indian or Alaskan Native	201	0.3	202	0.3	212	0.3	221	0.3	229	0.3
Mexican American/Chicano	831	1.4	882	1.4	964	1.5	951	1.5	1,040	1.6
Puerto Rican (mainland)	261	0.4	277	0.4	283	0.4	329	0.5	350	0.5
Subtotal	4,880	8.1	4,898	7.8	5,086	8.0	5,209	8.0	5,503	8.3
Other U.S. Groups										
Asian or Pacific Islander	1,422	2.4	1,592	2.6	1,777	2.8	1,924	3.0	2,518	3.8
Puerto Rican (Commonwealth)	532	0.9	617	1.0	700	1.1	798	1.2	856	1.3
Other Hispanic	426	0.7	489	0.8	567	0.9	683	1.0	847	1.3
Subtotal	2,380	4.0	2,698	4.4	3,044	4.8	3,405	5.2	4,221	6.4
Foreign Students	805	1.3	897	1.4	794	1.2	1,086	1.7	366	0.5
Unidentified	—	—	—	—	22	†	55	0.1	7	†
Grand Total	60,039	100.0	62,213	100.0	63,800	100.0	65,189	100.0	66,298	100.0

* In 1981–82, the definition of U.S. citizens was expanded to include students holding permanent resident visas. These individuals were previously recorded as foreign students. This reclassification means that the U.S. citizen categories absorbed the decrease noted in the foreign subtotal between 1980–81 and 1981–82.

† Less than 0.1 percent.

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State Retention of Medical School Graduates

Douglas E. Hough, Ph.D., and William D. Marder

Abstract—State governments support medical schools in their states for various reasons. A major reason is the perception that graduates tend to practice in the state where they attend medical school. In a study reported here, the authors examined this assumption by investigating the experience of physicians currently active in medical practice. The entire population of active U.S. physicians who graduated from U.S. medical schools was examined, as well as four selected cohorts of U.S. medical school graduates, using the American Medical Association's Physician Masterfile. The ability of states to retain their medical school graduates is related to physician characteristics (age, medical school, and practice specialty) as well as to state characteristics (population, physician-to-population ratio, and per capita income). The results indicate that, overall, the argument that states should support medical schools in order to ensure an adequate supply of physicians is less compelling than in the past, for reasons often beyond the control of the individual states.

State government officials have offered a variety of reasons for building or supporting medical schools. First, they may perceive medical schools to be symbols of state pride or progress. Second, the state may want to accept part of the public responsibility for contributing to the body of medical knowledge by funding research in a university setting. Third, medical schools may be viewed as a method of increasing the supply of medical care to the state's citizens through the use of university hospitals. Finally, state officials may consider medical schools to be the best vehicles for ensuring an adequate number of practicing physicians in the state—both from their own graduates and from the influx of out-of-state physicians who are attracted by the presence and availability of medical school facilities.

In an environment of federal cutbacks, declines in traditional state revenue sources, and increased competition for government funds, state governments must reassess their reasons for supporting undergraduate medical education. The authors in this paper examine the extent to which one of these reasons—increased physician supply through retention of medical school graduates—continues to be a legitimate basis for an individual state's support of medical education. The study utilizes the Physician Masterfile created by the American Medical Association (AMA) to determine the migratory patterns of the physician population as a whole. Four cohorts of medical school graduates are also studied. The migratory patterns are related to the characteristics of those physicians and of the states in which they practice.

Dr. Hough and Mr. Marder are research economists, Center for Health Policy Research, American Medical Association, Chicago. The conclusions and opinions expressed in this paper do not necessarily reflect the official position of the American Medical Association.

Previous Work

Various studies have analyzed the relationship between medical schools and location of physician practice. In their classic study of eight medical school graduating classes in 1915–1950, Weiskotten and colleagues (1) found that between 45 percent and 56 percent of the U.S. medical school graduates practiced in the same state as their school of graduation; they found that a substantially higher percentage of graduates of private medical schools migrated than public medical school graduates. Mason (2), also using the cohort approach, determined from AMA data that 43 percent of the 6,831 U.S. medical school graduates of 1960 were practicing in the same state as their school of graduation as of 1975.

In a more analytic context, Yett and Sloan (3) showed for 1965 graduates that graduation from a medical school in a state significantly increased the probability of practicing in the state; further state contact, for example, birth, internship, and/or residency in the state, substantially enhanced this probability. Wilensky (4) and Stefanu and colleagues (5) also confirmed this result for samples of medical school graduates in Michigan and Texas, respectively. Wilensky, for example, found that 42 percent of her sample of physicians graduating from Michigan medical schools in either 1960, 1965, or 1968 were practicing in the state in 1975.

Clearly, factors other than prior contact with a state influence practice location decisions. Yett and Sloan determined through regression analysis that climate, state medical licensure examination failure rate, and state per capita income were significant variables in this regard. Wilensky's analysis indicated that the important elements included climate, relative physician income, relative net migration, and the physician's perceived ability to obtain hospital privileges. These results in total yield two implications pertinent to the present study: (*a*) the presence of medical schools affects the number of physicians in a state; and (*b*) any analysis of this issue must consider both physician and state characteristics.

Physician Characteristics

Since 1906 the American Medical Association has maintained a Physician Masterfile containing professional and practice-related information on all physicians in the United States. The Masterfile has evolved from a simple record-keeping device for membership and mailing purposes to a file that can be used for a variety of AMA activities. Today the file contains "the most comprehensive and complete source of physician data in the United States" (6); information is continually updated on the physicians in this country and on those graduates of American medical schools who are temporarily practicing overseas. (Available elsewhere is more complete information on the Masterfile itself [6] as well as evaluations of the quality of the data collected [7].) The data presented in this paper came from the Physician Masterfile as of December 31, 1979. Because the study on which this paper is based was concerned with how many physicians currently practice in the state where they graduated from medical school, three categories of physicians were excluded from the analysis: (*a*) inactive physicians and physicians with unknown addresses; (*b*) resident physicians; and (*c*) graduates of foreign medical schools who were practicing in the United States.

Table 1 displays the distribution of all U.S.-trained physicians and relates current practice location to state of medical degree. This distribution is broken down into six categories: sex, type of medical school attended, reputation of medical school, practice specialty, age, and number of years since graduation from medical school. Of the 270,606 U.S. medical school graduates practicing as of the end of 1979, 39.9 percent (108,061) worked in the same state in which they received their medical degree; in other words, on average, states retained only two of every five physicians trained within their borders. There is no statistically significant difference in state retention between male and female physicians; the proportions moving from the state of their medical degree were 60.1 percent and 59.7 percent, respectively.

Significant differences are apparent with respect to medical school characteristics. In 1979, 47.7 percent of the 131,124 graduates of U.S. public medical schools were practicing in the same state, whereas only 32.7 percent of those who graduated from private medical schools were doing so. This higher propensity to move on the part of private school graduates suggests that support of public medical schools may be more effective in state retention than support to private schools. Table 1 also differentiates medical schools with respect to "reputation," which is defined here by the survey results of Cole and Lipton (8). (This study has generated substantial controversy, particularly over whether "reputation" is equivalent to "quality." These arguments notwithstanding, the Cole and Lipton ranking is used here, in part, because it has been corroborated by other studies [9].) A higher percentage of those who attended "elite" U.S. medical schools (that is, the 10 schools receiving the highest score in the Cole and Lipton study) moved out-of-state compared with those graduating from "non-elite" schools—65.9 percent versus 59.1 percent, respectively.

These two school characteristics—public versus private and "elite" versus "non-elite"—exhibit a curious interaction (not shown in table). Controlling for school reputation, the public/private dichotomy still holds; but the "elite"/"non-elite" distinction reverses itself when type of school is held constant. As a result, in ascending order, state retention was lowest for graduates of the eight "elite," private medical schools (27.7 percent), next for graduates of "non-elite," private medical schools (33.9 percent), followed by graduates of "non-elite," public schools (47.2 percent), and highest for graduates of the two "elite," public medical schools (53.7 percent).

The tendency for a physician to migrate from the state where he graduates from medical school can also be distinguished by practice specialty. Table 1 indicates that physicians in general/family practice or obstetrics/gynecology remained in their graduating states at a frequency much higher than the average physician. On the other hand, a higher proportion of psychiatrists and physicians in "other" specialties (primarily pathology) moved. This pattern implies, somewhat crudely, that state retention of medical school graduates is higher if their graduates choose primary care specialties over nonprimary care specialties.

Finally, Table 1 shows the influence of age and experience on physician migration. Except for the youngest age category (those under 30 years old), the percentage of medical school graduates practicing in the same state rose with age. (A similar, but not monotonic, pattern arises with the length of time since graduation.) In other words, older physicians were more likely to be practicing in the states where they graduated from medical school. Two explanations are available: either older physicians were moving back to where they attended medical school or the geographic mobility of physicians increased over time.

Table 2 offers some insights on this is-

TABLE 1

Number and Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by Physician Characteristics, 1979

Characteristic	Practicing in Same State		Not Practicing in Same State	
	No.	Percent	No.	Percent
All physicians	108,061	39.9	162,545	60.1
Sex				
Male	100,838	39.9	151,836	60.1
Female	7,223	40.3	10,709	59.7
Type of medical school*				
U.S. public	62,501	47.7	68,623	52.3
U.S. private	45,560	32.7	93,922	67.3
Reputation of medical school*				
"Elite"	12,624	34.1	24,360	65.9
"Non-elite"	95,437	40.9	138,185	59.1
Practice specialty*				
General or family practice	22,031	50.1	21,988	49.9
Internal medicine	20,359	38.1	33,092	61.9
Surgery	22,516	38.6	35,748	61.4
Pediatrics	6,454	37.4	10,797	62.6
Obstetrics-gynecology	6,666	42.5	9,022	57.5
Radiology	5,308	37.5	8,835	62.5
Psychiatry	7,068	36.7	12,174	63.3
Anesthesiology	3,390	39.1	5,287	60.9
Other	11,598	35.6	20,969	64.4
Unclassified	2,671	—	4,633	—
Age*				
<30	3,709	42.9	4,935	57.1
30–39	30,134	37.1	51,010	62.9
40–49	26,092	39.7	39,682	60.3
50–59	24,830	40.9	35,861	59.1
60–69	16,043	41.8	22,316	58.2
≥70	7,253	45.4	8,741	54.6
Years since medical school graduation*				
<10	24,834	39.3	38,329	60.7
10–19	28,178	38.6	44,838	61.4
20–29	24,554	40.9	35,457	59.1
30–39	18,688	39.2	29,037	60.8
40–49	9,499	43.6	12,311	56.4
≥50	2,308	47.3	2,573	52.7

* $p < .0001$.

sue. It shows the percentage of physicians who practice in the state where they attended medical school for four graduating classes: 1940, 1950, 1960, and 1970. These physician cohorts allow one to begin to evaluate both life-cycle and long-term environmental effects on physician migration. For instance, it is evident from the table that the physicians who were earliest in their careers (the class of 1970) had the lowest propensity to stay in-state of all the classes shown; this result is true for every category except for physicians who specialized in radiology, psychiatry, and "other." This pattern does not seem to be a life-cycle phenomenon. If it were, the earlier classes would have steadily increasing propensities to stay. However, physi-

TABLE 2

Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by Physician Characteristics and Year of Graduation, 1979

Characteristic	Percentage of Class 1940	 1950	 1960	 1970
All physicians	40.8	38.4	41.0	34.0
Sex				
Male	41.0	38.8	41.0	33.9
Female	37.9	35.5	40.6	34.9
Type of medical school				
U.S. public	49.7†	47.6†	50.9†	41.1†
U.S. private	34.7	31.2	31.4	25.7
Reputation of medical school				
"Elite"	36.1*	35.3	33.2†	28.7†
"Non-elite"	41.8	39.0	42.2	34.8
Practice specialty				
General or family practice	47.5†	45.7†	55.2†	45.2†
Internal medicine	38.6	36.4	37.8	32.4
Surgery	41.0	38.5	38.8	33.1
Pediatrics	39.3	37.1	41.3	28.6
Obstetrics-gynecology	46.7	43.8	44.3	41.5
Radiology	33.6	37.2	39.6	34.3
Psychiatry	33.6	34.5	41.1	35.6
Anesthesiology	33.8	33.0	42.7	29.8
Other	34.9	30.5	33.6	31.4

* $p < .05$.
† $p < .0001$.

cians in the class of 1960 (rather than older physicians) exhibited the highest inclination to stay in the state where they graduated for nine of the 16 categories shown (overall, female physicians, graduates from U.S. public medical schools, graduates from "non-elite" medical schools, and specialists in general/family practice, pediatrics, radiology, psychiatry, and anesthesiology).

When each of the categories is viewed separately, there seems to exist no apparent trend in state retention of medical school graduates overall, except for the dramatic decrease for the class of 1970. As with the entire physician population, there were no statistically significant differences in migration between male and female physicians for any of the physician cohorts but only a narrowing of the already small differences.

Some curious differences are apparent with respect to the medical school characteristics of those who remained in the state. As before, graduates from public and private medical schools differed greatly in terms of out-of-state migration, the most dramatic difference being between the 50.9 percent state retention of 1960 public medical school graduates versus the 25.7 percent retention rate of 1970 private medical school graduates. It also is evident that medical school reputation was a significant correlate with state retention for the classes of 1960 and 1970, but not for the class of 1950 and only barely so for the class of 1940. In all cases, however, the direction of difference was consistent, with graduates of "elite" schools being more likely to move out-of-state than graduates of "non-elite" schools.

Finally, each of the cohorts exhibited a statistically significant difference among practice specialties. However, the specific specialty rankings differed among the graduating classes. For all the graduating classes shown in Table 2, general/family practice and obstetrics/gynecology were the two specialties with the highest rate of state retention. However, the two specialties with the highest rate of out-of-state migration varied widely: radiology and psychiatry (class of 1940); anesthesiology and other (class of 1950); internal medicine and other (class of 1960); and anesthesiology and pediatrics (class of 1970). As a result, few conclusions can be drawn from these data about the trend in migration of specialists.

State Characteristics

The retention of physicians in the state where they attended medical school de pended not only on the characteristics of the physicians but also on the characteristics of the state itself—its size, its wealth, and the number of physicians already there. Tables 3 and 4 extend the previous section by examining state retention rates relative to three potentially important state characteristics, as of 1979: state population, state physician-to-population ratio, and state per capita income. The states are arranged in quintiles, from the lowest 10 states to the highest 10 states in each category.

As with Table 1, Table 3 displays the state retention experience for all practicing U.S.-trained physicians. It is apparent that a state's size (in terms of population) made a dramatic difference in its ability to retain the physicians trained in its medical schools. The smallest states (of the ones that had medical schools) were able to keep only 10 percent of those who graduated from their schools, compared with the nationwide average of 40 percent.

This result suggests that the small states that maintain public medical schools may consider other strategies to attract a larger physician population. Several small states have already done this. Of the 15 smallest states in terms of population, six (Alaska, Wyoming, Delaware, Montana, Idaho, and Maine) have no medical school. Alaska, Montana, and Idaho have developed a cooperative arrangement with the University of Washington School of Medicine (the WAMI Program), and Maine has subsidized medical schools elsewhere in New England that admit students from Maine.

As to the other states, there appeared to be a slight trend in favor of higher retention of medical school graduates in the more populous states. This trend is not consistent among all five population cate-

TABLE 3

Number and Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by State Characteristics, 1979

Characteristic	Practicing in Same State		Not Practicing in Same State	
	No.	Percent	No.	Percent
All physicians	108,061	39.9	162,545	60.1
State population*				
Lowest 20 percent	1,191	10.2	10,545	89.8
Second 20 percent	5,040	33.5	10,028	66.5
Third 20 percent	13,333	43.4	17,391	56.6
Fourth 20 percent	26,735	36.2	47,165	63.8
Highest 20 percent	61,762	44.4	77,416	55.6
State physician-population ratio*				
Lowest 20 percent	7,420	47.7	8,147	52.3
Second 20 percent	12,597	41.3	17,894	58.7
Third 20 percent	28,511	41.4	40,401	58.6
Fourth 20 percent	25,253	37.4	42,302	62.6
Highest 20 percent	34,280	38.9	53,801	61.1
State per capita income*				
Lowest 20 percent	9,017	41.1	12,949	58.9
Second 20 percent	14,287	38.1	23,240	61.9
Third 20 percent	28,514	42.7	38,322	57.4
Fourth 20 percent	34,718	38.4	55,664	61.6
Highest 20 percent	21,525	39.9	32,370	60.1

* $p < .0001$.

gories; however, the 10 largest states were able to keep the highest percentage (44 percent) of those who graduated from medical schools within their borders.

The second statewide category—physician-to-population ratio—implies that low physician density states may find medical schools to be effective devices for enhancing physician supply. There was an inverse relationship between a state's physician-to-population ratio and its ability to retain its medical school graduates. The states with the fewest physicians per 1,000 population as of 1979 were able to keep over 47 percent of their graduates, compared with 39 percent for states with the highest physician density. This reasonably consistent pattern suggests that the high-density states act, in part, as suppliers of trained physicians for the low-density states. Although this result does not take into account other important factors, it does seem consistent with classic location theory and the notion of economically viable market areas for physicians (10).

Finally, Table 3 demonstrates the medical school graduate retention experience of states by per capita income. Although the chi-square statistic indicates that there existed a significant difference among the income categories, there was no apparent trend one way or the other. This absence of a significant pattern is, in itself, significant. It implies that the "poorest" states did not necessarily have a greater problem than wealthier states with retaining graduates of their medical schools. That is, "poor" states did not act as training grounds for the future physicians of other states.

Table 4 completes the analysis by displaying state retention patterns by state characteristics for the four physician cohorts examined earlier. This table yields

TABLE 4

Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by State Characteristics and Year of Graduation, 1979

Characteristic	Percentage of Class			
	1940	1950	1960	1970
All physicians	40.8	38.4	41.0	34.0
State population				
Lowest 20 percent	11.3†	8.6†	8.7†	6.4†
Second 20 percent	22.4	31.5	35.6	35.1
Third 20 percent	41.1	42.4	47.8	41.5
Fourth 20 percent	36.1	37.0	39.8	31.7
Highest 20 percent	47.7	42.0	43.5	35.6
State physician-population ratio				
Lowest 20 percent	53.1*	50.4†	48.5†	47.9†
Second 20 percent	37.6	40.7	49.5	38.1
Third 20 percent	42.7	43.9	43.1	33.5
Fourth 20 percent	39.2	33.7	38.2	31.2
Highest 20 percent	40.4	35.2	37.1	32.0
State per capita income				
Lowest 20 percent	35.4*	42.8*	45.1†	41.4†
Second 20 percent	34.0	38.7	44.5	33.4
Third 20 percent	45.9	41.2	45.1	38.4
Fourth 20 percent	41.6	37.0	38.2	29.4
Highest 20 percent	39.8	35.2	35.9	33.2

* $p < .01$.

† $p < .0001$.

several insights not evident in Table 3. First, the state retention rate fell dramatically for both the least populous states and the most populous states: from 11.3 percent (class of 1940) to 6.4 percent (class of 1970) for the lowest quintile and from 47.7 percent (class of 1940) to 35.6 percent (class of 1970) for the highest quintile. This pattern was not evident in the other population categories. Thus, both the largest and the smallest states had increasing difficulty retaining their medical school graduates.

Second, although Table 3 indicates that the most populous states had the highest retention rates overall, Table 4 shows that this conclusion did not hold for the individual cohorts. Only for the class of 1940 did the largest states retain the highest percentage of their medical school graduates; for the other three cohorts, this distinction was held by the medium-sized states (and by substantial margins for the classes of 1960 and 1970). Thus, again it appears that these states had the advantage in terms of state retention.

Third, the overall pattern of state retention relative to a state's physician-to-population ratio shown in Table 3 is most apparent in Table 4 for the classes of 1960 and 1970. This may indicate that younger physicians were responding more dramatically to those changes in market areas reflected by physician-to-population ratios. This behavior might also be evidenced by the dramatic dropoff in state retention between the classes of 1960 and 1970 for all categories except for those states with the lowest physician-to-population ratio.

Finally, this table reveals that an inverse relationship existed between state retention and per capita income for the classes of 1960 and 1970, a result not evident overall. As a result, the "poorest" states did not experience the recent drop in retention of medical school graduates that the "richer" states had. This suggests that public support of medical education in these states may continue to be a viable method for attracting practicing physicians.

Conclusions

As stated earlier, many states support undergraduate medical education to help ensure an adequate supply of physicians within their borders. The authors have investigated the factors that influence the retention of medical school graduates within the same state. Unlike much of the literature on the relationship between medical school and subsequent physician practice location, the study reported here covered the behavior of all physicians practicing in the United States who had graduated from U.S. medical schools. It also included the location behavior of four physician cohorts chosen to reflect both life-cycle and environmental changes.

The data presented here suggest the following conclusions:

1. In terms of state retention, public support of public medical schools appears more effective than public support of private medical schools.
2. Given the limited information available on medical school quality, it appears that state retention would be increased by improving the reputation of the state's public medical schools but not that of its private medical schools.
3. To increase retention of their graduates within the state, medical schools might do well to emphasize primary care specialization.
4. The smallest states (in terms of population) have little expectation of retaining their medical school graduates.
5. States with the lowest physician-to-population ratios have the highest retention rates.
6. Contrary to expectations, states with the lowest per capita income are not at a

disadvantage with respect to state retention.

These conclusions suggest that state officials may wish to reexamine the bases of their support for medical education. Although the situations in particular states differ, the results found here imply that the physician supply argument for building or supporting medical schools may be less compelling than in the past, for reasons beyond the control of the states.

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DATAGRAM

Major Sources of U.S.-Trained M.D.s on U.S. Medical School Faculties

The number of active graduates of U.S. medical schools as of December 31, 1979, according to the American Medical Association's Physician Masterfile, was 324,045, an increase of 57,034 since 1973. The Association of American Medical Colleges' Faculty Roster System reports that 22,677 (7 percent) of these graduates were serving as full-time faculty members at U.S. medical schools on that date. The percentage of M.D. alumni with faculty appointments was roughly equivalent to that of 1968–69 and 1975. (See datagrams in the September 1970 and November 1975 issues of the *Journal of Medical Education.*) The percentage of graduates who had ever received faculty appointments at U.S. medical schools was, of course, greater than 7 percent, as that percentage encompasses only those individuals who were faculty members as of December 31, 1979.

Through the Faculty Roster System, it is possible to identify those schools that are unusually significant sources of faculty members and where orientation toward academic careers appears to be especially strong.

The data are approached in two forms. Table 1 presents the schools ranked by the number of alumni who were full-time faculty members at any U.S. medical school. Table 2 presents schools ranked by the fraction of the graduates who had full-time faculty appointments at schools other than the graduating institution.

Generally, the large and long-established schools produced the greatest number of graduates who had become faculty members. The five schools which produced the largest number of faculty members, Harvard Medical School, Columbia University College of Physicians and Surgeons, University of Pennsylvania School of Medicine, New York University School of Medicine, and Johns Hopkins School of Medicine, remained the same over the 1968–69 to 1979–80 period, providing 4,016 of the active M.D. faculty members in 1979–80.

The lists are dominated by East Coast schools, joined by a few institutions in the Midwest and South. Stanford University School of Medicine is the only western school on either list. In part, this is due to the fact that western schools are younger and have had fewer graduates, and it also may reflect regional recruiting patterns.

Table 1 provides the number and the percentage of alumni with faculty appointments at their graduating institution and the number of alumni receiving appointments at other medical schools. The medical schools having the highest fraction of their alumni faculty with academic appointments at their own institution were those at the University of Minnesota-Minneapolis, Indiana University, University of Michigan, University of Texas-Galveston, and Ohio State University.

The 25 schools listed in Table 1 represented the source of 52.6 percent of the 22,677 U.S.-trained M.D. graduates with faculty appointments at any U.S. medical school.

Table 2 shows the distribution of schools by the fraction of their alumni who were faculty members at institutions other than their own. Harvard Medical School leads this ranking as well, with 16.0 percent of its active physician alumni serving on the full-time faculties of other medical schools. Johns Hopkins University School of Medicine, Yale University School of Medicine, and University of Chicago Pritzker School of Medicine also had large fractions of their alumni serving on the faculties of other medical schools. These four schools had an average of more than 15 percent of their alumni serving on another medical school's faculty. This compared with an average of 5.4 percent for the alumni of all U.S. medical schools.

The ranking of the 25 schools shown in Table 2 includes only 15 of the schools that were listed on Table 1. The 10 new schools are

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The work on which this datagram is based was supported in part by the National Institutes of Health under contract 1-OD-2121.

TABLE 1

Major Medical School Origins of U.S.-Trained Full-Time Physician Faculty Members at U.S. Medical Schools, December 1979

School of Graduation	No. with Appointments at School of Graduation	No. with Appointments at Other U.S. Medical Schools	Total with Faculty Appointments	Percent of Alumni on Faculty at School of Graduation
Harvard	266	1,024	1,290	20.6
Columbia	88	635	723	12.2
University of Pennsylvania	124	588	712	17.4
New York University	66	591	657	10.0
Johns Hopkins	82	552	634	12.9
University of Michigan	147	392	539	27.3
SUNY-Downstate	41	471	512	8.0
Minnesota-Minneapolis	178	319	497	35.8
Yale	44	446	490	9.0
Cornell	53	419	472	11.2
Chicago-Pritzker	56	393	449	12.5
Washington-St. Louis	81	359	440	18.4
Rochester	72	349	421	17.1
Northwestern	8	407	415	1.9
Case Western	74	340	414	17.9
Duke	91	302	393	23.2
Illinois	31	345	376	8.2
Jefferson	34	331	365	9.3
Ohio State	82	253	335	24.5
Temple	62	249	311	19.9
Tufts	73	238	311	23.5
Texas-Galveston	73	222	295	24.7
Tulane	38	254	292	13.0
University of Virginia	62	228	290	21.4
Indiana	97	189	286	33.9
Subtotal	2,023	9,896	11,919	17.0
All other U.S. Schools	3,063	7,695	10,758	28.5
Grand Total	5,086	17,591	22,677	22.4

Albert Einstein College of Medicine of Yeshiva University, Stanford University School of Medicine, Vanderbilt University School of Medicine, State University of New York (SUNY) Upstate Medical Center College of Medicine, Medical College of Pennsylvania, Boston University School of Medicine, University of Vermont College of Medicine, University of Florida College of Medicine, University of Wisconsin Medical School, and Bowman Gray School of Medicine of Wake Forest University.

It should be noted that although some schools had similar percentages of their alumni serving on faculties at other schools, the actual numbers of such alumni differed. For example, the Vanderbilt University School of Medicine had 7.7 percent of its alumni with faculty appointments at other schools, and the SUNY Downstate Medical Center College of Medicine had 7.6 percent. However, SUNY-Downstate had 471 out of 6,187 physician alumni serving on faculties at other medical schools, while Vanderbilt had 186 such physician alumni from

TABLE 2

Active Physician Alumni with Full-Time Faculty Appointments at U.S. Medical Schools Other than Graduating Institution, December 1979

School of Graduation	No. with Appointments at Other Schools	Active Physician Alumni	Percent of Alumni Serving on Other Faculties
Harvard	1,024	6,410	16.0
Johns Hopkins	552	3,653	15.1
Yale	446	2,998	14.9
Chicago-Pritzker	393	2,756	14.3
Rochester	349	2,793	12.5
Columbia	635	5,083	12.5
Cornell	419	3,591	11.7
New York University	591	5,894	10.0
University of Pennsylvania	588	5,883	10.0
Case Western	340	3,608	9.4
Duke	302	3,220	9.4
Einstein	207	2,350	8.8
Washington-St. Louis	359	4,156	8.6
Stanford	211	2,592	8.1
Vanderbilt	186	2,406	7.7
SUNY-Downstate	471	6,187	7.6
SUNY-Upstate	230	3,060	7.5
University of Virginia	228	3,129	7.3
Medical College of Pennsylvania	135	1,878	7.2
Boston	222	3,089	7.2
Vermont	132	1,993	6.6
Northwestern	407	6,152	6.6
Florida	80	1,256	6.4
University of Wisconsin	202	3,461	5.8
Bowman Gray	109	1,916	5.7
Subtotal	8,818	89,514	9.9
All other U.S. Schools	8,773	234,531	3.7
Grand Total	17,591	324,045	5.4

a total of 2,406 graduates.

The rankings of some schools may have been affected by slow reporting by the schools of new faculty appointments to the AAMC Faculty Roster System during the past several years. The weaknesses in reporting affect all the statistics to some degree, but they would particularly affect the rankings of those institutions which have reported incomplete information to the roster system.

ELIZABETH J. HIGGINS, *director of the Faculty Roster System, and* TERRY BRYLL, *research assistant, both in the Division of Operational Studies, Association of American Medical Colleges, Washington, D.C.*

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Career Destiny of 550 Americans Several Years After Graduating from a Foreign Medical School

Aims C. McGuinness, M.D., and Henry R. Mason

Abstract—A longitudinal study of 550 Americans who took the examination sponsored by the Educational Commission for Foreign Medical Graduates in February 1972 after or while attending a foreign medical school has been completed. Ten years following graduation from the foreign school, it was found that 70 members of the original group have never qualified for graduate medical education in the United States and an additional 61 have not become licensed practitioners.

Since its establishment in the late 1950s, the examination sponsored by the Educational Commission for Foreign Medical Graduates (ECFMG) and its predecessor has been used as the principal yardstick for determining whether a foreign medical graduate has achieved a level of medical education equal to that of an American graduate and, therefore, is qualified for graduate training in a U.S. hospital or training center. The examination is given twice a year in several cities throughout the world. There is no limit to the number of times a person may take it. Since 1970 a student has been permitted to take the examination upon completion of two years of study at a foreign medical school.

In February 1972, 550 (3.5 percent) of the 15,735 persons who took the ECFMG examination were American citizens at time of entry into medical school and had completed at least two years of college on the U.S. mainland. A total of 245 (44.5 percent) of these persons passed the examination as compared with a pass rate of 43.1 percent for all persons taking the same examination. Seven years and again almost 10 years following the February 1972 examination, each of the 550 names were fed into the American Medical Association (AMA) Physician Masterfile, but only 480 could be found. This indicated that 70 members of the original group had not succeeded in passing the ECFMG examination. (The masterfile contains biographical data for all living graduates of U.S. medical schools and graduates of foreign schools who have qualified for graduate medical education in the United States.)

Medical Schools Attended

The 550 U.S. citizens had attended 78 medical schools in 21 countries outside the United States and Canada. As shown in Table 1, only 14 medical schools in nine countries had five or more of these U.S. citizens. Medical schools in the Republic of Ireland, Israel, and the Netherlands each had six U.S. citizens, but no single school in these three countries had four or more. Only three medical schools, the Uni-

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Dr. McGuinness, now retired, was associate director of the Educational Commission for Foreign Medical Graduates. Mr. Mason, also retired, was research associate with the Council on Medical Education, American Medical Association, Chicago.

TABLE 1

Performance by U.S. Citizens Taking the ECFMG Examination February 1972, by Country of Medical School Attended and by Individual Medical Schools*

Country	Medical School	No. of Candidates	No. Passing
Austria	University of Vienna	6	3
	Others	6	3
Belgium	Catholic University of Louvain	25	10
	Others	8	2
France	Faculty of Medicine, Montpellier	15	8
	University of Paris	5	2
	Others	12	4
Germany	University of Heidelberg	12	4
	Others	15	3
Greece	National University of Athens	4	2
	Others	1	0
Ireland		6	5
Israel		6	3
Italy	University of Bologna	135	56
	University of Rome	15	6
	Others	13	4
Mexico	Autonomous University of Guadalajara	177	88
	National University Autonomous of Mexico	15	5
	University of Nuevo Leon	6	2
	Others	7	0
Netherlands		6	5
Philippines	University of Santo Tomas	7	3
	Others	1	1
Spain	University of Madrid	6	0
	University of Zaragoza	6	1
	Others	6	0
Switzerland	University of Lausanne	7	4
	Others	4	3
		[illegible]	227

* Only countries and medical schools having four or more candidates are individually identified.

versity of Bologna, the Autonomous University of Guadalajara, and the Catholic University of Louvain had 25 or more U.S. citizens. A total of 337 (61.3 percent) of the examinees were students or graduates of these latter three schools.

Year of Graduation

As shown in Table 2, 299 (54.4 percent) of the U.S. citizens examined were undergraduates, of whom 143 (47.8 percent) passed the examination. A total of 158 (28.7 percent) of the Americans were examined in the first two years following graduation, of whom 77 (48.7 percent) passed. Thus, 83.1 percent of the examinees were either undergraduates or in the first two years following graduation. The "year of graduation" was that given by the candidate on his application to take the ECFMG examination. U.S. citizens in Mexican medical schools usually give as the "year of graduation" the year in which they will finish, or have finished, the four- or five-year didactic course rather than the year in which they will receive, or have received, the Titulo de Medico Cirujano (equivalent to the M.D. degree).

TABLE 2

Performance of Americans on February 1972 ECFMG Examination by Year of Graduation from Foreign Medical School

Classification/ Year of Graduation	No. of Candidates	No. Passing	Percent Passing
Undergraduates			
1976	1	0	—
1975	0	0	—
1974	11	3	27.2
1973	38	23	60.5
1972	249	117	46.9
Graduates			
1971	118	60	50.8
1970	40	17	42.5
1965–1969	56	14	25.0
1964 and earlier	37	11	29.7
Total	550	245	44.5

Fifty-six (10.2 percent) of the 550 examinees were from the graduating classes of 1965–1969 and 37 (6.7 percent) from the classes of 1964 and earlier. Of the 37 from the classes of 1964 and earlier, 15 were licensed practitioners in Connecticut, New York, and Pennsylvania who were seeking ECFMG certification for admission to the licensure examination of another state. Eight of these 15 physicians (53 percent) passed the examination, even though the combined pass rate for all examinees from the classes of 1964 and earlier was only 29.7 percent.

Number of ECFMG Tests

Table 3 shows the performance of the 550 U.S. citizens on the February 1972 examination in relation to the number of ECFMG tests previously attempted by the same group. There was no significant difference in the performance of Americans taking the examination for the first, second, and third time. The overall pass rate for them was 46.6 percent. The pass rate for this subgroup stands out in sharp contrast to the pass rate for the 34 candidates repeating the examination between the seventh and 20th time. The combined pass rate for the latter subgroup was 23.5 percent. These contrasting pass rates between examinees who have attempted the ECFMG test a few times and examinees who have taken it more than six times have been consistently characteristic for the ECFMG test. An examinee who continues to fail after several attempts bears out the uniformity and validity of the test.

TABLE 3

Performance of Americans on February 1972 ECFMG Examination in Relation to Number of Tests Previously Taken

No. of Exams Taken	No. of Candidates	No. Who Passed	Percent Who Passed
1	253	117	46.2
2	138	63	45.7
3	62	31	50.0
4	37	14	37.8
5	15	7	46.7
6	11	5	45.5
7–10	23	6	26.1
11–20	11	2	18.2

10-Year Follow-Up

Of the original cohort of 550 Americans who took the February 1972 ECFMG test, 480 (87.3 percent) were found in the AMA Physician Masterfile in March 1979 and again in December 1981. This would indicate that the 70 who were not found still had not earned an ECFMG certificate, had not completed a "fifth pathway" graduate medical education program, and were not licensed physicians. (The fifth pathway program consists of a year of supervised clinical training under the supervision of a U. S. medical school faculty. It was initiated by the AMA in 1971 to compensate for the weak clerkships at certain Mexican medical schools and enabled Americans to bypass a year of internship and a year of social service in Mexico. Upon completion of the fifth pathway year, the student is eligible to enter an approved residency without having earned an ECFMG certificate.) A total of 419 of the 480 physicians found in the file were licensed to practice medicine in at least one state.

A total of 321 had eventually become ECFMG-certified, and by August 1980 108 had successfully completed a fifth pathway program. This indicates that 429 (78 percent) of the original cohort had reached the point of eligibility for graduate medical education. Of this latter group, 10 failed to achieve or did not seek medical licensure.

Board Certification

By December 1981, 134 (28 percent) of the original cohort found in the AMA masterfile were certified by a U.S. specialty board. This is a considerably smaller percentage than the 40 percent of all physicians achieving board certification (1). Forty of those certified earned the certificate of the Board of Family Practice. Fourteen of the group were certified by each of the specialty boards of internal medicine and pediatrics and 11 by each of the boards of obstetrics/gynecology and urology, respectively; nine had earned a U.S. specialty certificate in radiology; eight and seven held certificates in psychiatry and general surgery, respectively. An additional 20 physicians held certificates of 15 other specialty boards. The total number of certificates earned by members of the cohort as of 1981 was twice the number earned by the group as of March 1979.

TABLE 4

Major Professional Activity of U.S. Physicians Eight to 10 Years After Graduating from Foreign Medical Schools

Major Activity	When Surveyed	
	March 1979	December 1981
Office-based practice	205	287
Hospital-based practice	45	60
Residency training	67	14
Medical administration	2	8
Research	31	17
Medical teaching	1	3
Inactive	8	11
Unclassified or unknown	116	74
Deceased	5	6
Total	480	480

Major Activity

In March 1979 and December 1981, when the names of the 550 physicians in the original 1972 cohort were fed into the AMA computer, the records of 480 that were found revealed their major professional activity as shown in Table 4. On the earlier date, 205 physicians were engaged in office-based practice, but in December 1981 this figure had risen to 287. Sixty members of the cohort were full-time hospital physicians on the latter date; eight were engaged in medical administration and 17 in research, and 14 were registered as hospital residents. Seventy-four of the physicians were in an "unclassified" category; it may be presumed that a large percentage of these consist of unlicensed members of the original cohort.

Summary

A longitudinal study was made of 550 individuals who were U.S. citizens at the time of entry into a foreign medical school and who took the February 1972 ECFMG examination to qualify for further medical training in a U.S. hospital or medical school. Their composite performance on the examination has been reported, and the subsequent experience of the group in pursuing a medical career in the U.S. has been evaluated by feeding their names into the AMA Physician Masterfile about 10 years after the February 1972 ECFMG examination. The data reveal that three-quarters of the original cohort of 550 students have achieved active careers as physicians in the United States. Biographical data for 70 members of the original group were not in the masterfile, indicating a failure to qualify for U.S. graduate training. Of the 480 found in the masterfile, only 419 held a medical license in at least one state. It may be concluded from these data that about 25 percent of the Americans who attended foreign medical schools in the 1960s and 1970s have never qualified as U.S. physicians.

Reference

1. *Profile of Medical Practice, 1975-1976.* Chicago: American Medical Association, 1977. Pp. 87-89.

DATAGRAM

Distribution of Women in U.S. Medical Schools, 1970-71 and 1980-81

The decade of the 1970s saw a significant increase in the number and proportion of women in U.S. medical schools that resulted in a more equal distribution of women students throughout all medical schools.

The increase in women students has been attributed to many factors, including the enactment of legislation for more equal opportunity in the educational setting and the growing perception by young women—and others—that professional careers are open to women. Another important factor was probably the overall expansion in the medical education capacity in this country that occurred simultaneously with these other changes. In effect, women students filled 65.1 percent of the new first-year positions created between 1970-71 and 1980-81 (Table 1).

The total number of women medical students increased from 3,639 (9.1 percent of total enrollment) in 1970-71 to 16,955 (26.2 percent) in 1980-81. The standard deviation for the

TABLE 1

New First-Year Entrants in U.S. Medical Schools

Year	Total Students	Women Students	Percent Women
1980-81	16,590	4,758	28.7
1970-71	11,169	1,228	11.0
Difference	5,421	3,530	65.1

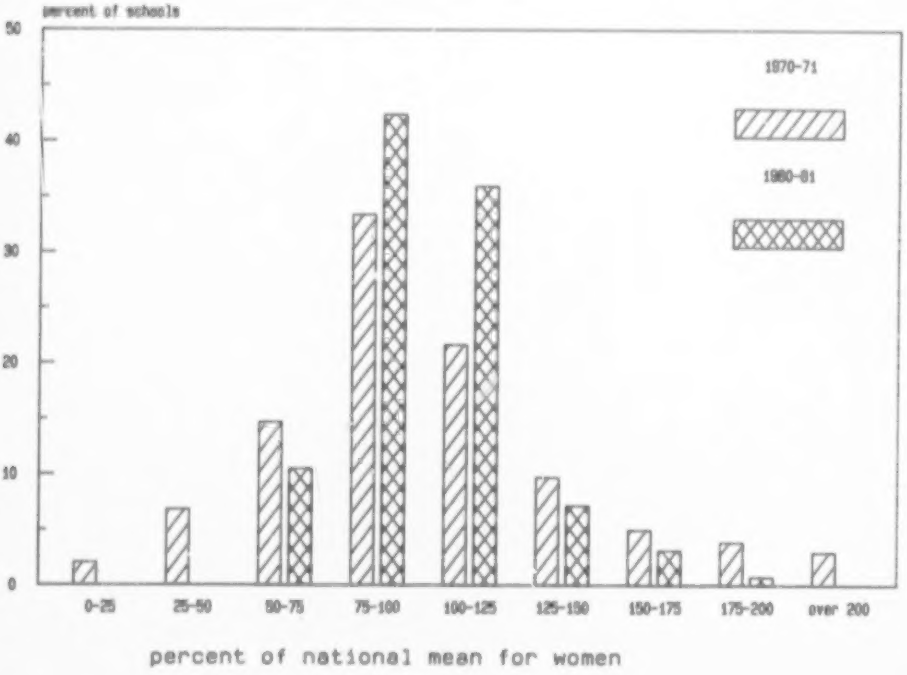

FIGURE 1

Women in U.S. medical schools as a percent of the national mean of women medical students, 1970-71 and 1980-81.

percent of women enrolled in each medical school in 1970–71 was 4.0 percent, nearly half the mean value. The 1980–81 standard deviation was 6.3 percent. This seems to indicate that the percentage of women in any medical school is becoming clustered around the mean. In 1980–81, 78 percent of all schools were within 25 percent of the mean, as compared with 55 percent in 1970–71 (Figure 1). (For the purpose of this analysis, the Medical College of Pennsylvania, formerly Woman's Medical College of Pennsylvania, has been excluded. Its high percentage of women enrollees—93.6 percent in 1970–71 and 58.6 percent in 1980–81—distorts rather than contributes to this analysis. Total enrollment of women including the Medical College of Pennsylvania was 9.9 percent in 1970–71 and 26.9 percent in 1980–81.)

Schools with a greater percentage of women in 1970–71 tended to increase the percentage at a lesser rate but still tended to have a greater percentage of women at the end of the 10-year period. While the increase in the percentage of women averaged 17.46 percent for all schools, it was slightly less for the top 50 schools (16.45 percent) and the top 25 schools (15.61 percent).

These data indicate that women students are more equally distributed throughout all U.S. medical schools than was the case a decade ago.

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Educational Origins of M.D. Faculty Members In Five Groups of Medical Schools

Charles R. Sherman, Ph.D., and Terry Bryll

Abstract—Five groups of medical schools are used to describe the relationship between the type of institution where a physician serves as a full-time faculty member and the type of institution where the M.D. degree was awarded. For each group of schools, percentage distributions are presented showing where the graduates now teach full time. The educational origins of all U.S.-trained full-time M.D. faculty members in each group are also shown in percentage distributions. These distributions are presented including and excluding individuals who are faculty members at the same schools where the M.D. was earned. Research schools are seen to contribute proportionally more of their graduates to U.S. faculties in all groups of schools. The group with proportionally more students oriented toward primary care specialties contributes faculty members largely to other schools in the same group. Research schools also evidence a similar "group inbreeding." All groups are net contributors to faculties at medical schools founded after the mid-1960s.

Numerous vacancies on faculties of clinical science departments continue to cause concern for the future supply of M.D.s to serve as teachers and researchers at U.S. medical schools (1, 2). Statistics are periodically published that list the major sources of U.S.-trained M.D.s on U.S. medical school faculties. In the most recent compilation (3), as in others (4, 5), 25 medical schools are listed as the leading sources of faculty members. A second ranking names 25 schools to be the principal sources of faculty members calculated as a proportion of their living graduates. Invariably the major research centers dominate both lists. A few additional schools with exceptionally large numbers of alumni also rank among the institutions producing the most faculty members for the American medical education system.

A study (6) conducted at the Association of American Medical Colleges (AAMC) compared medical schools on 17 variables indicating relative educational emphases on research and on primary care specialties. The analysis disclosed a pattern of four groups, or clusters, of like institutions. The generally acknowledged research centers comprised one of the groups. The less research-intensive schools divided themselves into three groups, varying principally in their preferred acceptance of students who, at least at the outset of their medical education, favored practice in pri-

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mary care specialties. Faculty members at these institutions may include proportionally more M.D.s whose skill lies in clinical care and teaching rather than in research. Where do these schools with different educational emphases get their faculties? Of their graduates, how many enter academic medicine, and where do they go to teach? In this paper the authors present some new statistics that address these questions.

Method

Aggregated data for five groups of medical schools are used to describe and compare the M.D. faculty of each group and the graduates of each group who become medical school faculty members. The principal data are derived from the AAMC Faculty Roster System, reconstructed to reflect the faculty positions held at all U.S. schools on January 1, 1980. These data are complemented by counts of active alumni of each school as of December 31, 1979, derived from the American Medical Association's Physician Masterfile.

The 22,677 faculty members described here were all full-time teachers who held an M.D. degree from a U.S. medical school. The educational origins of Ph.D.s on the faculties are not examined in this paper, even though many of them did graduate work in medical schools. Also excluded are 6,591 physician faculty members (22.5 percent of all full-time physician faculty members in the United States) who received their degrees outside the United States. Faculty members who were serving part-time are also excluded from the tabulations.

The classification of U.S. medical schools into five groups is based on the AAMC study (6) in which four clusters of schools were differentiated. The fifth group comprises the relatively "new" medical schools (founded after the mid-1960s), which were omitted from the previous classification on technical grounds. As the authors of the previous study acknowledged, their findings were not meant to imply that there are only four types of medical schools or that every school has been accurately and immutably classified. Thus to avoid misunderstanding, the groups are not assigned names, nor are their complete memberships listed here. The groupings are useful for the present purpose of describing a pattern in the sources of medical school faculties. The five groups are labeled "1," "2," "3," "4," and "new." Each of the first four groups is further identified by the name of the "most typical" school, reported in the AAMC study to be closest to the statistical "center" of each cluster. Generally, Group 1 schools matriculate proportionally more students with an interest in primary care specialties than do schools in Group 2, and Group 2 more so than Group 3. Group 4 is generally comprised of research-intensive academic medical centers.

Group 1 consists of 29 schools and is typified by the University of Nebraska College of Medicine. Group 2 consists of 24 schools and is typified by Georgetown University School of Medicine. Group 3 consists of 17 schools and is typified by Northwestern University Medical School. Group 4 has 14 schools and is typified by the University of Pennsylvania School of Medicine. The Southern Illinois University School of Medicine typifies the 42 schools in the fifth group. The data reported below describe each group and not the "typical" school named.

Results

Descriptive analyses are reported in five sections. First, the five groups are compared on their overall contribution of graduates to U.S. medical school faculties. The last four sections examine current faculties. Each faculty member is classified jointly by the group of schools where he earned an M.D. and the group of schools where he now serves on a faculty. The percentage distributions of where each group's graduates went to teach are compared in the second section. The percentage distributions of where each group's faculties earned their M.D.s are compared in the third section. After a comparison of rates of group "inbreeding," the fourth and fifth sections present revised distributions of graduates' careers and faculty origins.

Graduates on faculties—Table 1 presents the numbers and percentages of graduates from each group of schools who were serving on faculties of U.S. medical schools as of January 1, 1980. Graduates of Group 4 schools were twice as likely to become full-time medical school faculty members as were graduates of all schools. Relatively few of the graduates of the new schools were on faculties. This was due in part to insufficient elapsed time for their graduates to have advanced and filled faculty positions. It also may have been due in part to the less developed research component of newer schools compared with established schools.

The percentages presented in Table 1 are low estimates of each group's total contribution of graduates to the academic world. Nationally, about 5 percent of M.D. faculty members leave academic medicine each year (7). Thus, there were additional graduates of all groups who had served in academic medical settings prior to this study or who were serving outside the United States.

Locations of faculty positions—Table 2 presents the percentage distribution of where graduates of each group who were teaching held their current full-time appointment. For graduates of each of the five groups, an individual was most likely to become a teacher at the same medical school or at one that was similar to it. In Table 2 the largest percentages in all rows are the diagonal elements. Faculty members who were graduates of Group 1 and

TABLE 1

Number of Active Graduates from Five Groups of U.S. Medical Schools and Percentage Who Were Full-Time Faculty Members at Any U.S. Medical School, January 1, 1980

School Group*	Typical School in Group†	No. of Active Graduates from Group	No. of Graduates on Any Faculty	Percentage on a Faculty
1	University of Nebraska College of Medicine	97,045	5,060	5.2
2	Georgetown University School of Medicine	101,858	5,824	5.7
3	Northwestern University Medical School	60,417	4,212	7.0
4	University of Pennsylvania School of Medicine	53,525	7,321	13.7
New	Southern Illinois University School of Medicine	11,200	260	2.3
All U.S. Schools		324,045	22,677	7.0

* For explanation of groups, see text.

† Schools named typify schools in group. Data in this and subsequent tables describe entire groups.

TABLE 2

Percentage of M.D. Graduates Teaching Full Time Who Were Faculty Members at Each of Five Groups of U.S. Medical Schools

School Group of Graduation	No. of Graduates Teaching	Teaching Location of Graduates by School Group (in percentages)*				
		1	2	3	4	New
1	5,060	48.8	12.9	10.8	9.5	18.0
2	5,824	15.1	36.3	13.4	14.6	20.7
3	4,212	15.6	15.4	32.9	15.6	20.6
4	7,321	16.8	16.7	13.9	35.1	17.6
New	260	16.2	12.7	12.3	8.5	50.4
All U.S. Schools	22,677	23.3	20.6	16.6	20.2	19.4

* Rows may not sum to 100.0 percent due to rounding.

new schools were the most likely to hold their appointment at a school in their group of graduation.

Graduates teaching at schools somewhat dissimilar to their alma mater (that is, schools in other groups) are denoted by off-diagonal elements in the table. Graduates of all groups were more likely to be on faculties at the new schools than on faculties in any group of schools other than their own group. This effect is most striking for Group 1. A graduate of a school in Group 1 (primary care oriented) was twice as likely to join a faculty at a new school (18.0 percent) than at a research-intensive medical school, Group 4 (9.5 percent).

Sources of M.D. faculties—Table 3 gives a different perspective on the same data used to derive Table 2. Instead of describing graduates, however, the percentages describe the faculties. Each row is the percentage distribution of the educational origins (by groups of medical schools) of all full-time M.D. faculty members in the particular group of schools. For each group except the new schools, faculty members were most likely to have graduated from the school where they were teaching or from another school in the same group. The new schools derived only 3 percent of their faculty members from graduates of other new schools. This is not surprising, given the time required to complete specialty training before joining a faculty and given the fact that the new medical schools were not commonly research oriented.

From this perspective, faculty inbreeding appeared to be most extensive among Group 4 schools (56 percent of their faculty members graduated from Group 4 schools) and least extensive among Group 3 schools.

For each group except the new schools, Group 4 was the second most plentiful source of M.D. faculty members. This probably indicates that research was an activity of all medical schools and that faculty members hired to do research were drawn from physicians who chose or were exposed to an intensive research setting during medical school.

Group 4, the research schools, derived a smaller proportion (10.5 percent) of their faculty members from Group 1, the primary care schools, than did any of the other groups of schools (46.8, 13.9, 14.6, and 20.7 percent).

Faculty inbreeding within the school groups shown in tables 2 and 3 had two components: (*a*) faculty members who received the M.D. degree from the same school at which they were teaching and (*b*) faculty members who earned their M.D.

degrees at other schools within the same group of similar schools. Table 4 distinguishes faculty members from both types of sources for each of the five groups of medical schools. Group inbreeding percentages (column D) are the same percentages as the diagonal elements of Table 3. For each group it is equal to the sum of column B ("institutional inbreeding") and column C (percentage of faculty members who were graduates of other schools in the same group—referred to as "residual inbreeding"). For all groups except Group 4, the institutional inbreeding was about two-thirds of the total group inbreeding. For Group 4, less than half of the total inbreeding was due to individual schools' reclaiming their own graduates as faculty members. The revised patterns of graduates' faculty positions and of faculties' educational origins, after removing the effects of institutional inbreeding, are presented below.

Graduates on other faculties—The data in Table 5 exclude graduates who were teaching at the same school where they received their M.D. degree. The apparent tendency for graduates of schools in any group to become teachers at other schools in the same group (group inbreeding) is not universally true after the influence of institutional inbreeding is statistically removed. In the adjusted data in Table 5, it may be seen that graduates were more likely to be on faculties in the new schools than in any other group. This is under-

TABLE 3

Percentage of Full-Time Faculty Members Who Graduated from Each of Five Groups of U.S. Medical Schools

School Group	No. of M.D. Faculty Members	Source of M.D. Faculty by School Group of Graduation (in percentages)*				
		1	2	3	4	New
1	5,276	46.8	16.6	12.5	23.3	0.8
2	4,671	13.9	45.2	13.9	26.2	0.7
3	3,756	14.6	20.7	36.8	27.0	0.9
4	4,577	10.5	18.5	14.3	56.2	0.5
New	4,397	20.7	27.4	19.7	29.2	3.0
All U.S. Schools	22,677	23.3	25.7	18.6	32.3	1.1

* Rows may not sum to 100.0 percent due to rounding.

TABLE 4

Percentage of Full-Time U.S.-Trained M.D. Faculty Members Who Graduated from Schools in the Same Group in Which They Were Teaching

School Group	(A) No. of U.S.-Trained Full-Time Faculty Members	(B) Percentage of Faculty in (A) from the Same School	(C) Percentage of Faculty in (A) from Other Schools in the Same Group	(D) Percentage of Faculty in (A) from All Schools in the Same Group (B + C)
1	5,276	31.4	15.4	46.8
2	4,671	27.2	18.0	45.2
3	3,756	24.2	12.6	36.8
4	4,577	25.4	30.7	56.2
New	4,397	1.9	1.1	3.0
All U.S. Schools	22,677	22.4	15.8	38.2

TABLE 5

Percentage of M.D. Graduates Teaching Full Time at Other Than School of Graduation Who Were Faculty Members at Each of Five Groups of U.S. Medical Schools

School Group of Graduation	No. of Graduates Teaching at Other Than School of Graduation	Teaching Location of Graduates by School Group (in percentages)*				
		1	2	3	4	New
1	3,401	23.8	19.1	16.1	14.2	26.7
2	4,552	19.3	18.5	17.1	18.6	26.5
3	3,303	19.9	19.6	14.4	19.8	26.2
4	6,157	19.9	19.9	16.5	22.8	20.8
New	178	23.6	18.5	18.0	12.4	27.5
All U.S. Schools	17,591	20.6	19.3	16.2	19.4	24.5

* Rows may not sum to 100.0 percent due to rounding.

standable since senior-level faculty members in the new schools could only have come from schools of other groups.

After accounting for both institutional inbreeding and the supplying of faculty members for new medical schools, a tendency toward group inbreeding is seen only in Group 1 (primary care emphasis) schools and Group 4 (research emphasis) schools (23.8 percent and 22.8 percent, respectively). Group 2 graduates who were teaching were fairly uniformly distributed among the other three groups of schools (other than the new schools). Graduates of Group 3 schools (with comparatively neither a research nor a primary care emphasis) who were teaching seemed the least likely to teach at another Group 3 school (14.4 percent).

Outside sources of faculties—The figures in Table 6 do not include faculty members who received their M.D.s at the same school where they were teaching. A comparison of the percentages within each column indicates again that residual inbreeding among institutions occurred only in groups 1 and 4 schools. Both groups provided a greater percentage of their own faculties than they provided to other groups, even when institutional inbreeding was ignored. The opposite was true for Group 3 schools, as the four other groups of schools had a larger percentage of faculty members who were graduates of Group 3 schools than the Group 3 schools had. The inbreeding in Group 3 schools, therefore, was due mainly to institutional inbreeding, which was partially offset by the low-residual inbreeding of graduates among other schools in the group. Graduates of schools in Group 2 who served at other institutions had similar representation on the faculties of all groups. The inbreeding in Group 2 schools, while also due mainly to institutional inbreeding, was affected little by the residual inbreeding among Group 2 schools, as shown in Table 6.

While all groups exhibited significant overall inbreeding, only two groups, as stated above, exhibited residual inbreeding. Group 4 (research oriented) schools evidenced the strongest residual inbreeding (41.2 percent of the faculty members were graduates of other Group 4 schools) and the lowest level of utilization of Group 1 (primary care oriented) schools' graduates. Group 1 schools also showed a tend-

TABLE 6

Percentage of Non-Alumni Full-Time Faculty Members Who Graduated from Each of Five Groups of U.S. Medical Schools

School Group	No. of Non-Alumni M.D. Faculty Members	Source of M.D. Faculty by School Group of Graduation (in percentages)*				
		1	2	3	4	New
1	3,617	22.4	24.3	18.2	33.9	1.2
2	3,399	19.2	24.7	19.1	36.0	1.0
3	2,847	19.2	27.4	16.7	35.6	1.1
4	3,413	14.2	24.8	19.2	41.2	0.6
New	4,315	21.1	27.9	20.1	29.8	1.1
All U.S. Schools	17,591	19.3	25.9	18.8	35.0	1.0

* Rows may not sum to 100.0 percent due to rounding.

ency to hire the graduates of other schools in their group, while showing no preference for the graduates of Group 4 schools.

Discussion

The results show that five groups of U.S. medical schools drew their faculties from characteristically different patterns among the graduates of five groups of schools. Rate of institutional inbreeding (hiring their own graduates) does not completely account for the observed levels of group inbreeding. Thus, the groupings themselves, while prone to classification errors, do provide de facto evidence of diversity among institutions that may be related to their educational emphases or philosophies. The crossover of individuals between groups, however, demonstrates the compatibility of the different philosophies within the total U.S. medical education system.

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COMMUNICATIONS

In-State Experiences of Physicians Serving Rural Underserved Communities: The Case of Colorado

George E. Fryer, Jr., and Watson A. Bowes, Jr., M.D.

In Colorado inaccessibility of medical services is primarily a rural problem. Of Colorado's 63 counties, 36 have been federally designated, either fully or in part, primary care manpower shortage areas. None of the 21 fully designated counties lies in a standardized metropolitan statistical area (SMSA) nor contains a town of as many as 10,000 persons.

In the study reported here, the authors examined the association of birthplace, medical school, and site of residency training with location of practice. Special emphasis was placed on the rural underserved areas of the state.

Method

The Colorado Department of Health surveyed all physicians licensed to practice medicine in the state in December 1979. A respondent rate of 92.7 percent was attained. An analysis was performed by the authors on the data of the 4,089 allopathic practitioners who had completed their residencies and who completed the survey.

A rural-urban dichotomy predicated on population of county and its largest town was devised using 1980 census data. The 53 rural counties all contain populations of less than 30,000 and no single community of more than 13,000. The state's other 10 counties were classified urban, and all of them had a population of more than 80,000. The validity of this rural-versus-urban distinction had previously been documented (1).

Results and Discussion

Table 1 portrays the number and percentage of Colorado physicians who were born, attended medical school, and served a residency in the state. Residency training was clearly the dominant experience. Physicians practicing in sparsely settled areas, however, had more frequently attended the University of Colorado School of Medicine than taken residency in state (23.8 percent versus 18.6 percent). The percentage of rural physicians born in Colorado (17.9 percent) was about the same as those whose graduate medical training had taken place in state. A substantially greater percentage of physicians practicing in rural areas had been born and attended medical school in Colorado when compared with urban physicians. On the other hand, rural practitioners had served Colorado residencies much less often than urban physicians.

Among the 2,616 physicians practicing in the four largest of the Denver SMSA counties, 913 (34.9 percent) had taken their graduate medical education in the state. Only 559 (21.4 percent) had attended the University of Colorado School of Medicine in Denver. This indicates that physicians are inclined to practice in close proximity to the location of their residency but not to the medical school they attended.

Practice in a rural site was strongly associated with birth in the state (chi-square = 9.378, *p* value = .0022), modestly associated with undergraduate medical education in the state (chi-square = 1.695, *p* value = .1940), and inversely related to Colorado residency training (chi-

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TABLE 1

Location of Practice and Training of Colorado Physicians, 1979

Practice Location	Total	Born in Colorado		Graduated from Colorado School of Medicine		Had Residency Training in Colorado	
		No.	Percent	No.	Percent	No.	Percent
Rural county	365	65	17.9	87	23.8	68	18.6
Urban county	3,724	455	12.2	779	20.9	1,175	31.6
Total	4,089	520	12.7	866	21.2	1,243	30.4
Rural western county*	203	24	11.8	36	17.7	34	16.7
Rural eastern county*	67	20	29.9	31	46.3	22	32.8

* The western and eastern most rural regions comprise 36 of Colorado's 53 rural counties and are served by 270 of the state's 365 rural physicians.

square = 26.284, p value = .0000). These findings suggest that while availability of graduate medical educational opportunities has a favorable effect on this state's supply of physicians, it may contribute to their geographic maldistribution within Colorado.

The severity of medical underservice across rural Colorado varies geographically. This state's mineral rich and recreationally popular Western Slope is better served medically than the agriculturally dependent, rural counties of the Eastern Plains. Thirteen of the 16 eastern counties have been designated either totally or in part as medically underserved areas. Only five of the 20 rural western counties have been so designated. The physician-to-population ratio in the east is 1 to 2,053 compared with 1 to 1,022 for the western counties.

Table 1 compares the relationship between Colorado experiences and manpower within these two rural regions of the state. Each of the experiences was more frequently associated with physicians practicing in the underserved plains than on the Western Slope. On the Western Slope, 66.5 percent (135 of 203 physicians) had none of these experiences in Colorado while only 29.9 percent (20 of 67) of the Eastern Plains physicians had no previous Colorado experience. The differential between eastern (46.3 percent) and western (17.7 percent) county rural physicians having attended the University of Colorado School of Medicine was the most substantial among the three experiences.

Conclusion

A student's awareness of rural community need for medical service has been found to be a factor in his decision to establish rural practice (2). Benefits have been documented from the placement of medical students in rural areas for clinical experiences by the area health education center (AHEC) program of the University of Colorado Health Sciences Center (3). The findings in the study reported here suggest that individuals with previous experiences in the state are more sensitive to the needs of medically underserved Coloradoans than those with no previous experience here. Colorado residency training was more frequently related to medical practice in urban than in rural areas of the state. In-state birth and undergraduate medical education on the other hand were strongly associated with rural practice. These influences, particularly medical school attended, are especially significant in the more underserved rural areas.

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DATAGRAM

Net Patient Revenue at University-Owned Teaching Hospitals

Since 1971 the Department of Teaching Hospitals of the Association of American Medical Colleges (AAMC) has conducted an annual survey of financial and general operating data for the university-owned members of the AAMC's Council of Teaching Hospitals (COTH). Of the 63 hospitals sent questionnaires in April 1981 requesting information on their fiscal 1980 operations, 62 hospitals responded. To provide compatibility with data from previous survey years, nearly all the questions asked a year ago were retained. Data pertaining to operating income are reported on an accrual basis.

Net Patient Revenue

For the first time, net patient revenue has been accurately identified by source of revenue for a majority of the responding hospitals. In past years, the data received made it extremely difficult, and in many instances impossible, to distinguish between gross and net patient revenue figures. The current analysis, however, reports aggregate dollar and percentage totals for fiscal 1980 in terms of net patient revenue.

The capability to differentiate net from gross patient revenue by source will vastly improve the accuracy and comparability of future survey results. For the current survey year, however, this progress actually limits meaningful comparisons with revenue data from previous years, since the level of sophistication in patient revenue data collection varies greatly from hospital to hospital and only 60 percent of the current respondents were able to report net patient revenue by source.

Hospitals with State Appropriations

As in fiscal 1979, 44 (nearly 71 percent) of the respondents reported receipt of state appropriations in fiscal 1980. Not surprisingly, 41 of these hospitals were publicly owned. The distribution of state-funded hospitals by proportion of total operating revenue received from state appropriations from fiscal 1970 to fiscal 1980 is shown in Table 1. Since fiscal 1979, two hospitals were added to the group for which state appropriations accounted for less than 20 percent of total operating revenues.

A total of $493.1 million was appropriated by the states to the 44 state-assisted hospitals in fiscal 1980, only about $10 million more than in the previous fiscal year. As shown in Table 2, $288.5 million of this total went to the 25 state-assisted hospitals that were able to report net patient revenue by source. For these institutions, state appropriations represented 17.8 percent of their aggregate net patient revenue and was the second leading source of such revenue behind Medicare (23.5 percent). Commercial insurance was third at 17.2 percent.

The absolute dollar amounts of individual state appropriations in fiscal 1980 ranged from $686,000 to $45.5 million. The mean state appropriations among the 44 recipients of state funds was $11.2 million in fiscal 1980, up slightly from the $11.0-million average in fiscal 1979. The mean total net patient revenue figure for the 25 state-assisted hospitals able to report such revenue information was $64.8 million in fiscal 1980.

TABLE 1

Distribution of State-Funded Teaching Hospitals by Proportion of Total Operating Revenue Received from State Appropriations, 1970 Through 1980*

Fiscal Year	Percentage Total Operating Revenue from State Appropriations			
	1-20 Percent	21-40 Percent	41-60 Percent	61-100 Percent
1980 ($n = 44$)	28	12	4	0
1979 ($n = 44$)	26	13	5	0
1978 ($n = 41$)	25	13	3	0
1977 ($n = 41$)	25	13	2	1
1976 ($n = 40$)	24	13	3	0
1975 ($n = 38$)	19	13	6	0
1974 ($n = 30$)	13	12	5	0
1973 ($n = 28$)	13	9	6	0
1972 ($n = 34$)	12	12	9	1
1971 ($n = 34$)	11	15	5	3
1970 ($n = 30$)	12	8	10	0

* Reported on a cash basis from fiscal 1970 to 1973 and on an accrual basis thereafter

Hospitals Without State Funds

Eighteen of the 62 hospitals in the survey sample received no state appropriations in fiscal 1980. Of these, 12 were able to submit net patient revenue data by source. This information is displayed in Table 3. As in the case of their state-assisted counterparts, these dozen institutions received the largest portion of their total net patient revenue (30.6 percent) from Medicare. Blue Cross (24.1 percent) and com-

TABLE 2

Sources of Operating Revenue for University-Owned Teaching Hospitals That Received State Appropriations

(In thousands of dollars)

Revenue Source	Net Patient Revenue, Fiscal 1980 ($n = 25$)		Total Operating Revenue, Fiscal 1979 ($n = 44$)		Total Operating Revenue, Fiscal 1978 ($n = 41$)	
	Amount	Percent	Amount	Percent	Amount	Percent
State appropriations*	288,501	17.8	483,632	17.1	412,179	17.6
Blue Cross	245,177	15.1	385,429	13.6	308,761	13.2
Commercial insurance	278,958	17.2	470,284	16.7	396,610	17.0
Self-pay	114,208	7.1	176,854	6.3	180,467	7.7
Medicare	380,481	23.5	611,283	21.7	487,256	20.9
Medicaid	211,916	13.1	427,423	15.2	347,417	14.9
County appropriations	15,657	1.0	25,399	.9	19,465	.8
City appropriations	0	0	4,175	.1	6,928	.3
Additional welfare payments	33,601	2.1	20,161	.7	27,250	1.2
Workman's compensation	6,861	.4	†		†	
Other	43,497	2.7	215,783	7.7	149,656	6.4
Total	1,618,857	100.0	2,820,423	100.0	2,335,989	100.0

* Includes some appropriations earmarked for non-patient care use.

† Included in "Other" category.

TABLE 3

Sources of Operating Revenue for University-Owned Teaching Hospitals That Did Not Receive State Appropriations

(In thousands of dollars)

Revenue Source	Net Patient Revenue, Fiscal 1980 ($n = 12$)		Total Operating Revenue, Fiscal 1979 ($n = 19$)		Total Operating Revenue, Fiscal 1978 ($n = 22$)	
	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	211,213	24.1	297,380	18.9	329,509	21.2
Commercial insurance	149,051	17.0	232,864	14.8	261,081	16.8
Self-pay	81,355	9.3	189,388	12.1	190,654	12.3
Medicare	267,820	30.6	424,820	27.0	401,744	25.9
Medicaid	73,363	8.4	270,534	17.2	268,464	17.3
County appropriations	510	<.1	557	<.1	507	<.1
City appropriations	0	0	222	<.1	131	<.1
Additional welfare payments	6,778	.8	7,556	.5	10,457	.7
Workman's compensation	3,672	.4	*		*	
Other	81,820	9.3	147,441	9.4	87,801	5.6
Total	875,582	100.0	1,570,762	100.0	1,550,348	100.0

* Included in "Other" category.

TABLE 4

Sources of Operating Revenue by Type of Care in University-Owned Teaching Hospitals*

(In thousands of dollars)

Income Source	Net Patient Revenue, Fiscal 1980 ($n = 35$)				Total Operating Revenue, Fiscal 1979 ($n = 58$)			
	Outpatient		Inpatient		Outpatient		Inpatient	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	39,097	13.2	409,331	20.9	54,593	10.6	621,168	19.2
Commercial insurance	38,729	13.1	372,070	19.0	74,088	14.4	587,156	18.1
Self-pay	61,062	20.6	131,430	6.7	116,769	22.8	243,268	7.5
Medicare	51,195	17.3	577,368	29.5	91,562	17.9	929,361	28.7
Medicaid	36,897	12.5	236,274	12.1	95,942	18.7	581,359	17.9
State appropriations	42,094	14.2	70,923	3.6	24,072	4.7	67,151	2.1
County appropriations	4,315	1.5	11,852	.6	1,395	.3	5,159	.2
City appropriations	0	0	0	0	3,300	.6	160	<.1
Additional welfare payments	4,715	1.6	34,800	1.8	3,168	.6	23,009	.7
Workman's compensation	1,580	.5	8,869	.5	†		†	
Other	16,308	5.5	104,430	5.3	47,993	9.4	181,834	5.6
Total	295,992	100.0	1,957,347	100.0	512,882	100.0	3,239,625	100.0

* Data reported only for those hospitals able to separate revenue into inpatient and outpatient categories.

† Included in "Other" category.

mercial insurance (17.0 percent) were the next leading sources. The average total net patient revenue was $73.0 million in fiscal 1980.

Medicare, Blue Cross, and the "other" patient revenue category each had a higher percentage of total net patient revenue among the non-state-assisted hospitals than institutions that received state appropriations. On the average, Medicaid contributed significantly less to hospitals without state funding.

Sources of Revenue by Type of Care

Data on revenue sources from those respondents able to separate net patient revenue into inpatient and outpatient categories in fiscal 1980 are presented in Table 4. The number of such institutions totaled 35. For outpatient services, self-pay patients provided the leading source (20.6 percent) of net patient revenue. Medicare (17.3 percent) and state appropriations (14.2 percent) were the next highest sources. On average, outpatient net patient revenue per institution totaled $8.5 million in fiscal 1980.

For inpatient services, Medicare was by far the leading source (29.5 percent) of total net patient revenue in fiscal 1980. Blue Cross (20.9 percent) and commercial insurance (19.0 percent) were the next leading sources. In contrast to the high outpatient percentages for self-pay patients and state appropriations, these sources contributed significantly less (6.7 percent and 3.6 percent respectively) as portions of total inpatient net patient revenue. The mean total inpatient net patient revenue figure among these hospitals in fiscal 1980 was $55.9 million.

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Despite these figures, other evidence suggests the narrowing in the nation's resource pool as libraries struggle with declining budgetary growth rates and increasing inflation. The number of serial titles published continues to expand, yet the total number of current serial titles in the nation's health sciences libraries in 1979 was 6,000 titles less than it was in 1973 (122). From 1980 to 1981 the average number of serial titles held by AHSC libraries increased by only one percent, yet the average serials budget increased by 15 percent and is now close to consuming a quarter of the library's total budget. Every two years since 1976 the average medical school library budget has increased by 22 percent, barely keeping pace with inflation. The overall view is less favorable. Total support for medical school libraries in 1976 was 3.11 percent of total medical school operating expenses. Since then this support has steadily declined while medical school operating budgets have increased (Table 3).

If budgets for purchase of materials are not to increase to take up the shortfall that is developing, money must be allocated to develop strategies that optimize the organized purchase and sharing of resources between institutions. An AAHSLD survey in 1981 found AHSC library directors giving top priority in the next two to four years to automation and collection development, in that order. The curatorial responsibilities of the AHSC libraries are still in need of attention.

EDUCATION

Over the past 10 years the National Library of Medicine through the MLAA programs sponsored many efforts to adapt new technologies to health sciences education and to foster interinstitutional sharing of instructional resources through such network systems as the Health Education Network for computer-aided instructional materials. The emphasis has been on developing learning resources centers for the use of audiovisual materials, models, and patient simulation programs.

A creditable record has also been achieved in library educational programs. Of the 97 health sciences libraries responding to the 1981 AAHSLD survey, 22.9 percent had established written educational program goals, and 26.3 percent had written educational objectives to guide their programs; 10 (10.3 percent) schools offered formal courses for credit, while 24 (24.7 percent) offered elective courses in the medical school. The courses emphasize library research skills and knowledge of standard reference works, indexing and abstracting tools, and data bases. More than one-third of these courses were being

TABLE 3

Total Support for Health Sciences Libraries in United States

Fiscal Year	Medical Schools' Operating Budgets* (In millions)	Percent Change	Health Sciences Libraries' Expenditures† (In millions)	Percent Change	Percent Library Support‡
1975	1,519		47		
1976	1,800	18.5	56	19.2	3.11
1977	2,197	22.1	66	17.9	3.00
1978	2,451	11.6	68	3.0	2.77
1979	2,828	15.4	77	13.2	2.72
1980	3,316	17.3	75	−2.6	2.26

* Data from the AAMC Institutional Profile System.

† Data compiled by the University of Texas Health Science Center at Dallas, 1975–1977 (15–17), and the Association of Academic Health Sciences Library Directors, 1978–1981 (12–14).

‡ *J.A.M.A.* education issues from 1979 to 1981 (Table 26) gave figures nearly a percentage point lower: 1978 = 1.89, 1979 = 1.76, 1980 = 1.71. Those data were from 112 medical schools in 1978 and 1979 and 119 medicals schools in 1980.